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TOWARDS AN ANALYSIS OF ERRORS MADE BY  
UNIVERSITY STUDENTS IN THE TRANSLATION OF  
ENGLISH NOMINAL GROUPS, AND THE EFFECT ON  
READING COMPREHENSION.

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## LIST OF ABBREVIATIONS

- DLEM - Department of Modern Foreign Languages (Departamento de Letras Estrangeiras Modernas).
- EL I - English Language I - course to be taken by all undergraduate students at the UFPB.
- ESP - English for Specific Purposes (Inglês Instrumental).
- irg - inadequate insertion of a rankshifted group.
- std - (number of) students.
- T1C - the first non-specific text applied to the Nursing and the Physics Groups of students.
- T2C - the second non-specific text applied to the Nursing and the Physics Groups of students
- T()N - specific text applied to the Nursing Group. The number inserted between T and N indicates its order of presentation in class.
- T()P - specific text applied to the Physics Group. The number inserted between T and P indicates its order of presentation in class.
- UFPB - Federal University of Paraíba (Universidade Federal da Paraíba).
- wbt - word-bound translation.

## RESUMO

Esta dissertação tem como objetivo demonstrar que a interpretação de grupos nominais em inglês constitui uma das dificuldades encontradas pelos alunos de Língua Inglesa I da Universidade Federal da Paraíba no estudo de textos escritos em inglês.

A experiência foi realizada com dois grupos de alunos, sendo o primeiro da área de Saúde e o segundo da área de Tecnologia. Foram utilizadas traduções de textos específicos e não-específicos a essas duas áreas, a fim de se diagnosticar a influência da sequência dos elementos estruturais - m (modifiers) e h (headword) - dos grupos nominais de dois e de mais de dois vocábulos em inglês, sobre seus equivalentes em português e sua conseqüente interferência na compreensão.

Esperava-se que o conhecimento do assunto tratado nos textos e o número de vocábulos formadores dos grupos nominais em inglês pudessem ser obstáculos à produção de grupos nominais equivalentes em português onde a influência dessa sequência estivesse refletida. Os resultados obtidos revelaram que essa influência persistiu nos dois tipos de textos, tanto nos específicos quanto naqueles não-específicos às áreas acadêmicas desses alunos, persistindo também em grupos nominais de dois e de mais de dois vocábulos.

Inferi-se que o conhecimento do assunto e o número de vocábulos formadores dos grupos nominais não foram fatores suficientes para obstacular a interferência da sequência dos elementos estruturais dos grupos nominais em inglês no que diz respeito à compreensão dos textos estudados.

## ABSTRACT

This dissertation aims at giving evidence of the fact that the interpretation of nominal groups in English texts has constituted an area of difficulty faced by students attending English Language I Course at the UFPB.

The experiment involved two groups of students, one of which belonged to the Health Sciences area, and the other to the Technology area. Translations of texts related to those students' academic fields as well as texts which were not linked to their major disciplines were employed as a means of diagnosing the influence of the sequence of the structural elements - namely, m (modifiers) and h (headword) - in English nominal groups, formed by two and more than two words, on their equivalents in Portuguese, and its consequent interference with comprehension.

It was expected that the knowledge of the subjects discussed in those texts and the number of words forming a nominal group might be obstacles to the rendition of equivalent Portuguese nominal groups in which the influence of that sequence was reflected. However, that influence was detected in the texts which were specific to students' academic fields as well as in the non-specific ones, and it also persisted in nominal groups formed by two and more than two words.

The results of the experiment have shown that the knowledge of the subjects discussed in both types of texts and the length of the English nominal groups inserted in those texts were not decisive factors in the overcoming of the difficulties posed by that influence on the comprehension of the texts studied.



## INTRODUCTION

Since 1970 the Federal University of Paraíba has been offering English courses for non-humanities students. The inclusion of these courses in other academic fields of studies, besides the ones offered to Letras students, was due to the urgent needs imposed by the number of foreign textbooks, periodicals, and reference books to be consulted by undergraduate students.

The teachers in charge of this new aspect of the teaching of English, in this case as an auxiliary subject to other disciplines, have been facing some difficulties in the preparation of a syllabus whose basic condition might meet the students' needs. These courses are nowadays called English Language I, and aim at an efficient and objective performance on the students' part so that their studies and research can be carried out successfully.

The aim of this work is to test the hypothesis that undergraduate students at the Federal University of Paraíba have difficulty with English nominal groups which, in turn, interfere with comprehension of written texts. Nominal groups is a term employed by the Systemic linguistics, notably M.A.K. Halliday and J.McH. Sinclair whose terminology and system of grammatical analysis will be briefly summarized in the next chapter. This type of difficulty was detected when students were asked to translate texts from English into Portuguese. It should be emphasized that we are aware that our students are not trained to be professional translators; they are required to translate, or to interpret the text to be studied in class, so that the

teacher can verify the existence of any area of linguistic difficulty; the translation of texts gives the teacher the chance to assess the students' ability to decode the information transmitted in the written medium. This view will be defended at greater length in chapter 4.

The experiment involved the study and translation of twenty-eight texts, two of them dealing with general and the other twenty-six with specific subjects. The general texts, hereafter referred to as TC, or non-specific ones, were the first to be administered to two groups of students; one group belonged to the Medical School; that was the Nursing Group. The other group was composed of Physics students. The purpose of dealing with groups of different academic areas was to detect significant statistical differences between the error rate per student, in each nominal group, in the non-specific texts and in the specific ones.

The choice of these two groups of students, belonging to different areas of studies aimed at verifying whether they both shared the same kind of linguistic difficulties in texts related to their specific areas.

The Nursing Group translated fourteen specific texts, and the Physics Group twelve specific ones; there were thirty-eight students in the former group and twenty-four in the latter one. Both groups had English classes from Monday to Friday; each class lasted fifty minutes. Most of the students were taking their first semester at the university; only two, in the Nursing Group, were seniors but this fact did not alter the validity of our research. The total of newly admitted students who formed

both groups was 60; these 60 students and the two seniors worked together, since they were all obliged to take the English Language I Course as one of their compulsory disciplines.

Students in both groups were about the same age and their social, cultural and economical background has not constituted one of the important aspects to be taken into consideration in our research; we have chosen these two groups of students in accordance with the common process of enrolment at the UFPB; this choice has, therefore, been a random selection as to students' social, cultural and economic background.

The texts were distributed at the beginning of the class; then, after a short period of reading, either silent or not, the students were asked to start their translations; the use of a bilingual dictionary was permitted. To discover the real difficulties which might appear in the texts to be translated, any type of comment, either on vocabulary or syntax, was made after all the students had finished their translations. However, the usual procedure in this course is to read the text first, make some general comments on points which the teacher thinks are difficult, and then the students do the exercises required and the translation of the text.

The translations which constitute the corpus of this research were rendered during the first semester of 1979. The presence of all the students in class was constant. The ones who dropped out totalled four, and they did so at the very beginning of the course. They rendered two translations, at most, and these have not been included in the corpus to facilitate the statistics tests which would be used for the analysis of errors.

Some aspects need to be emphasized: 1) the students with whom we have worked had just left high school, with the exceptions mentioned above; 2) the types of texts studied in class and the procedures followed in the administration of the texts were a novelty for the students; we know, from experience, that the teaching techniques and the translation of technical texts are aspects peculiar to the English Language I Course at the UFPB, and not employed in high-school English courses in Paraíba. Although translations are usually avoided as a current activity in high school, students, nevertheless, tend to translate mentally; even so, we are entitled to say that translation as a decoding process is a new technique with which they are not familiar; 3) the subjects dealt with in all the twenty-eight texts were supposed to be familiar to the students; the Department of Modern Foreign Languages (DLEM) at the UFPB establishes the texts, assuming that the content of some of them has been studied in high school and that most of them deal with subjects which are included in the university programme of each group of students' specific area. For instance, if the Nursing Group has to study the respiratory system, a text about bronchitis is likely to be chosen. In fact, the DLEM has tried to work with topics already seen by students, or the ones which are to be seen in the programme designated to their specific areas; 4) since the main condition for a student to sit for a university entrance examination is to have finished his high-school course, most of the students in the Nursing Group and the Physics one are considered 'false beginners' by which we mean those students who have been exposed to English grammatical constructions, and a great number of lexical items at high-school level, however weak

their control of them might be. They form the ideal types of students who still permit us to estimate their linguistic performance when faced with technical texts; the complexity of the code as the vehicle for the information transmitted in the text makes the core of the question.

Our experience as teachers of English enables us to recognize and admit the existence of other deficiencies which interfere with comprehension; these may give rise to further studies and research. It is hardly likely that the nominal groups constitute the only area of difficulty for EL I students. However, the detection of one of the difficulties which may block comprehension of technical texts as they are administered in the English Language I Course at the UFPB is our main concern.

Our objectives aim at verifying: a) the extent to which the English nominal groups actually comprise an area of difficulty in the translation of technical texts; the incidence of word-bound translation errors and inadequate insertions of rankshifted groups is to be compared with other types of errors which have also been made in nominal groups.<sup>1</sup> b) whether the average of error rates per student, in each nominal group, in the non-specific texts is equal or different from the average of error rates per student, in each nominal group, in the specific texts; c) whether the length of the nominal groups constitutes a factor of difficulty in the translations of those nominal groups.

**NOTE**

<sup>1</sup>Word-bound translation errors - wbt - are those resulting from the translation of every word in a nominal group in the same sequence as the English exponents. Inadequate insertions of a rankshifted group - irg - refer to the failure to convert pre-headword adjectives in English into post-headword phrases in Portuguese. See chapter 1.

## CHAPTER 1

## SYSTEMIC ANALYSIS OF ENGLISH NOMINAL GROUPS

In considering the translations rendered by the Nursing and Physics Groups we noticed the high incidence of errors which occurred mainly in English ngps made up of two or more words. The types of words forming the ngps are described later, in this chapter.

The most common errors demonstrated that students were not able to identify the structural elements of a ngp. This fact showed the need for a theoretical model against which the difficulties found in the treatment of English ngps could be considered with a view to facilitating the explanation of the problems involved in the decoding process of those ngps.

Besides the Systemic<sup>1</sup> analysis of ngps, other models might have been used as theoretical bases on which the possible causes and explanations for the errors in ngps might be clarified. However, in its consistency and relative simplicity the Systemic model<sup>2</sup> offers a clear and practical view for teaching purposes. We have already tried to transmit to our students, briefly, some Systemic notions concerning the way by which systemicists work and describe how the parts fit together in a whole, in that the sentence is the 'whole'; it seemed that the way each grammatical item has been arranged in a scale of five ranks has been quite easily grasped by our students.<sup>3</sup> A brief outline follows.

Sinclair arranges his units of description into a rankscale, that is, a scale of five ranks in which a downward movement from the sentence to smaller units may take place. A

sentence is thus made up of one or more clauses; a clause is made up of one or more groups; a group of one or more words and a word is made up of one or more morphemes. The possibility of a clause structure functioning within a group is permitted by that downward movement. This is called rankshift; thus, THE GIRL WHO CAME TO DINNER LAST NIGHT is a ngp where we can find the structural elements of a clause - WHO CAME TO DINNER LAST NIGHT.

Each rank comprises a set of three categories: structure, system and class.

a) Structure: each word, or each clause, has its internal and external relations; in a clause, for instance, we may find a subject (S) predicator (P) object (O) complement (C) and an adjunct (A); the clause as a whole forms a sentence or part of a sentence. The subject, the predicator, the complements, the objects and the adjuncts are the structural parts of a clause. A group<sup>4</sup> may consist of three elements: one headword (h) which is compulsory, and, in the case of a ngp, the modifiers (m) and the qualifiers (q); the representation of the structure of a ngp might be (m) h (q); the parentheses indicate that the enclosed elements are optional.

b) System: it is the most important category

"because the distinctions of meaning arise from systemic contrast. If we say that 'verbs can be active or passive' we are talking informally about the system of voice."<sup>5</sup>

In Systemic grammar, system constitutes a category characterized by the number of possibilities where a choice must be made. In a ngp singular and plural may be the terms of



a system in the study of ngps. Sinclair also admits that

"a grammar is a very complicated network of systems which cut each other in many different ways" <sup>6</sup>

but the symbols he uses to follow the movement along this complicated network of systems are very much simplified.

c) Class: this category is related to each element of structure considered as exponents. A word may be the exponent of one of the terms in a systemic choice; thus, the exponent of a ngp may be a common noun, a class which can be considered as indefinitely large. In the ngp THE MAN we have THE, which is the (m) element in the structure of the ngp THE MAN, and also one exponent of the class of deictics. MAN is the headword of the ngp THE MAN, and the exponent of the class 'noun'.

### **Nominal Group Structure**

A ngp has three elements: (m) h (q); but only the headword h, is compulsory; moreover, a single word may be the exponent of a ngp. In HE CAME THEN we have three groups: HE, the exponent of a ngp; CAME, the exponent of a verbal group; and THEN, the exponent of an adverbial group.

A ngp may operate as the exponent of the structural elements of a clause; in the analysis of the errors made in ngps we did not take into account the role that the ngps played as exponents of the different elements of the clause structure. An illustration of some ngps as constituents of some structural elements of a clause may be suitable for the purpose of this work.

In JOHN STAYED FIVE MINUTES the underlined parts make

up a ngp operating at A, that is to say, as an adjunct; in THE MAN CAME, THE MAN is operating at S, as subject; in I LIKE THE MAN, it is operating as an object, at O; in I ASKED THE MAN TO GO is operates at o/s; sometimes a ngp operates at C, as in HE WENT AWAY A HAPPY MAN.<sup>7</sup>

Some ngps can also be included in some prepositional groups; Sinclair says that

"the prepositional group is a combination of a preposition and a nominal group which together make up one single adjunct".<sup>8</sup>

For the purpose of this work, the distinction that Sinclair makes between adverbial groups and prepositional groups does not alter the results of our work; he says that

"It is useful to think of prepositions as 'transitive adverbs' requiring a nominal group to complete the structure".<sup>9</sup>

We intend to take this ngp which is used to characterize a prepositional group into account if, and only if, it has constituted an area of difficulty in the translations which interest us in our analysis. If, for instance, the students had had any difficulty in translating HE JUMPED OFF THE HIGH GARDEN WALL, the underlined part of this sentence would be taken into consideration since the problem which we are interested in is characterized in THE HIGH GARDEN WALL.<sup>10</sup>

On the second page of this chapter we have mentioned what Sinclair defines as rankshift; for instance, a nominal group may play a part in the structure of another nominal group. In 'The boy's book was on the table' 'The boy's' comes at the beginning of the group and is called a modifier (m). In 'A hat this size will be fine', 'this size' comes at the end and is

called a qualifier (q). <sup>11</sup> Moreover, in 'The car I had last winter...'

"I had last winter" is part of the identification of the car, and it cannot be safely missed out. That is the reason why we label it (q) for qualifier in the nominal group, and not a separate clause in sentence structure. It is a stretch of language which looks like a clause, but behaves like a word; internally it is a clause, externally it is a word. Such a structure is called a rankshifted structure, in this case a rankshifted clause.<sup>12</sup>

So far we have mentioned few examples where rankshifted groups and a rankshifted clause have occurred. This concept of rankshift is one of the important aspects in our analysis of errors made in nominal groups since the misuse of the process of rankshift has proved to be one of the difficulties faced in the process of translating certain nominal groups from English into Portuguese. For example, Catford,<sup>13</sup> who adopts the systemic grammar for his linguistic theory of translation, considers 'category-shift' any changes of structure, of classes, of terms in a system which may occur between the source-language (English, in this case) and the target-language (Portuguese, in this case). In translating 'The thin, flexible drum' a nominal group in English whose headword is 'drum' and 'the thin, flexible' are modifiers, our students find it difficult to shift the structure (m) h into h (q) as the equivalent translation into Portuguese requires; indeed, in the English nominal group 'The thin, flexible drum' we have the m m m h structure which would be shifted to the Portuguese m h q q structure, 'o tímpano delgado e flexível'. <sup>14</sup>

m	h	q	q
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The insertion of a nominal group within another nominal group



We have concentrated our work on the problems posed by the translation of the exponents of (m) and h; we have restricted our analysis of errors to the translation of headwords and their modifiers, assuming that the translation of exponents operating at (q) in English ngps are not included in the most common problems faced by the students of the two groups of Nursing and Physics.

Sinclair and Catford have presented the different classes that can operate at (m).<sup>18</sup> That is to say, at (m) we have a system which "divides up the items it operates on, so after several moves in delicacy a class may be the result of several subdivisions."<sup>19</sup>

The scale of delicacy concerns the fineness of the distinctions in meaning represented by structural elements. Catford states:

"... if we are going to attribute any structure at all to English nominal groups we must set up three elements: H (head), M (modifier) and Q (qualifier). Our least delicate description of English Ngp structure is thus (M...N) H (Q...N), which means that one element, H, is always present, and this may be preceded and/or followed by one or more element M or Q. Thus we should say, at a primary degree of delicacy, that the groups:

Old/men

These Three old/men  
have the structure MH and M M M H. By taking a further step down the delicacy scale we recognize different classes of the element M - namely d (deictic) o (numerative) e (epithet), and we can say that 'These three old/men' has the structure d o e H, in which d o e is a more delicate statement of structure than M M M."<sup>20</sup>

Sinclair expands the explanation of this delicacy scale

and includes the element n which is the element at (m) that stands for a noun modifying another. Thus, the elements that may operate at (m) are d, o, e and n; here are some examples of English nominal groups with d, o, e and n operating at (m) and h.<sup>21</sup>

dh	oh	eh	nh
1. the man	1. two men	1. good food	1. copper kettles
2. this chap	2. many people	2. fine old buildings	2. Morris cars
3. every single book			3. fish soup
4. his own car			4. jute warehouse
5. all those people			5. cotton frock
6. a car			6. noun modifier

This table shows the types of word-classes which operate at:

d - deictics and their submodifiers, such as 'single', 'own'; the use of 'all' emphasizes the specific reference of the deictic used; Sinclair says that 'all' can precedes the specific deictics, only.<sup>22</sup> It is considered a pre-deictic.<sup>23</sup>

o - numerals with countable nouns as headwords.

e - adjectives, or epithets. They can be submodified by words such as 'very', 'more' and 'most' which "add the notion of degree to the description of the adjectives."<sup>24</sup> This notion of degree added to the description of the adjectives may be conveyed by means of an inflection, such as in 'some nicer shoes' and 'the nicest shoes'; besides the submodifiers which add the notion of degree, some others, such as 'a most'

'moderately', 'really', 'quite', 'awfully', etc. are said to convey a "tempering meaning".<sup>25</sup> Operating at the class of adjectives whose distinctive word-structure usually lies in the addition of suffixes such as: -al, -en, -ic, etc. is also introduced together with the adjectives which refer to colour. n - nouns can modify nouns. Sinclair claims that

"Much a technical jargon is of this kind, and it is difficult to understand because the precise meaning relationship between each noun and the next is not clear from the syntax; also each pair of nouns can make up a special compound which then operates as a single word, and eventually gets written with a hyphen between the two words, or a single compound word."<sup>26</sup>

He still says that there is no limit to the power of compounding nouns in modern English. As an example, he presents the nominal group 'The vent control knob key lubricant can'

"Stress and intonation patterns can usually be relied upon to supply the correct meaning in such compounds as the tendency is for the headword to receive nuclear stress: e. g. 'an English teacher' and 'an English teacher'. Unfortunately this information does not appear in the written form."<sup>27</sup>

The use or the omission of a hyphen in the nominal groups whose elements in the delicacy scale at (m) appear in a great number - namely the exponents of n - seems to mean very little to our students; moreover, the texts used for our students show that there is little consistency among writers in this respect.

Considering noun modification, we can say that there

are two main types:

a) nh structure, where n classifies the headword, as

in 'technicolor film'  
                   n                  h

b) sn and sh structures, where the subclassifier (here represented by s, and also with a noun as its

exponent) classifies its headword; as examples of

both structures we can quote Sinclair's: <sup>28</sup>

'instruction - manual holder'  
                   s                  n                  h

'transistor radio-set'  
                   n                  s                  h

Two other types of modifiers have also to be taken into account: the -ing words which operate at e and n, and the -en words in position e, either as qualitative adjectives (those which can be submodified by words like 'very', 'more', etc) or as classifying adjectives (the ones that are said to convey the meaning of classifying rather than describing <sup>29</sup>).

Besides being able to operate at h, -ing words can also belong to three types of e, namely i) qualitative adjectives; ii) classifying adjectives and iii) sub-classifiers of nouns at n and h. <sup>30</sup> Thus, we can have as examples of:

i) a very exciting person

ii) the sinking ship

iii) a fishing- tackle shop (sub-classifier at n)

the meeting-place (sub-classifier at h)

-ing words and -en words are important kinds of modifiers for our analysis, because they can also be exponents of P, and as such they have caused problems to our students.

Both types of modifiers, -ing ones and -en ones, can



be submodified by adverbs or sub-classified by nouns; the examples from Sinclair's <sup>31</sup> are:

- i) a well-fed calf (-en word sub-modified by an  
adverb)
- ii) a milk-fed calf (-en word sub-classified by a  
noun)
- iii) an ill-fitting grey suit (-ing word sub-modified  
by an adverb)
- iv) a magnificent record-breaking jump (-ing word sub-  
classified by  
a noun).

The modifiers can thus present a delicacy scale whose structural elements are d, o, e and n; at d we have the general and specific deictics; at o the numerals, at e the qualitative adjectives, the classifying adjectives and the 'colour' adjectives. <sup>32</sup> Submodifiers can operate at d, as in 'every single book'; at e, as in 'a very beautiful view', 'very blue, interesting eyes'; <sup>33</sup> and at n, as in 'instruction- manual holder' and at h in 'textiles price-control'. The latter examples are probably the most difficult ones since there is not a consistent way to mark the relationship between one noun and the other, or others, in a nominal group in the written medium.

The errors which interest us most in this work are the ones which have maintained the same sequence as the English structural elements in their equivalents in Portuguese. <sup>34</sup> Thus, basically, we have been interested in the errors whose main characteristic was to order the exponents in Portuguese according to the sequence of the structural elements in English nominal groups. Moreover, we have restricted our work to two

structural elements in nominal groups, namely (m) and h, since the translation into Portuguese of exponents operating at (q) has not constituted a problematic area for our students; in Portuguese the headword is generally followed by qualifiers; except for the deictics which also operate at (m) in Portuguese, the most usual position of the words which are said to belong to the adjective class operating at e and n in the English delicacy scale of modifiers is after the headword, at q. This does not imply that an exponent of e and n cannot operate at (m) just like they do in English. However, errors of sequence co-occurred with other types of errors, such as non-recognition of 's structure, errors of lexis plus non-recognition of 's structure, to quote some.

We have labelled as word-bound translation<sup>35</sup> errors, those which have resulted from the translation of every word of a nominal group following the same sequence of the exponents in English. Thus, we consider wbt error the following examples:

<u>English nominal group</u>	<u>Portuguese translation by students</u>
1. <u>HEAD</u> <u>SHAPE</u> m        h	1. ' <u>cabeça</u> <u>moldada</u> ' h        q
2. <u>NORMAL</u> <u>EVENT</u> m        h	2. <u>normal</u> <u>eventual</u> h        q.

From the first example of translation a second type of error was also detected: the inadequate insertion of a rankshifted group. (This type of error has the short form irg error). As the two students who translated the first nominal group into 'cabeça moldada' did not detect the headword of the English nominal group (HEAD SHAPE) they also showed that they were not

able to insert a rankshifted prepositional group within the

nominal group in Portuguese; 'forma da cabeça' might be the expected translation into Portuguese, where 'da cabeça' may be considered a rankshifted group operating at (q), and the representation would be [q], and 'forma' would be the exponent of h in Portuguese.

Some other students were aware that an insertion might be made but they did not succeed in doing it properly. For instance, the translation of:

<u>English nominal groups</u>	<u>Portuguese translation by students</u>
3. <u>TEACHING LAW</u> m h	3. 'ensino de leis' (by 4 students) h [q]
4. <u>SKIN COLOUR</u> m h	4. 'pele de cor' (by 3 students) h [q]

Within these two broad types of errors, wbt and irg, we have classified fourteen types of errors which were made along with the wbt and irg ones. This detailed classification<sup>36</sup> was based on the results in Portuguese. Here are some examples of the fourteen types according to the rendered equivalents in Portuguese:

- I - Error of sequence and non-recognition of 's structure:  
THE PUBLIC AUTHORITY'S RESPONSIBILITIES  
'as públicas autoridades responsáveis'
- II - Error of sequence in 's structure:  
THE COUNTRY'S UNIVERSITIES  
'os países dos universitários'
- III - Error of sequence, lexis and non-recognition of 's structure  
PLANCK'S UNIVERSAL CONSTANT  
'tābua universal constante'

- IV - Error of sequence with Portuguese deviant forms:  
THE 'NOBLE' METALS  
'o nobre metais'
- V - Error of sequence and non-recognition of h:  
THE CHANGING NEEDS  
'mudanças necessárias'
- VI - Errors of sequence and production of two or more hs:  
ADMINISTRATIVE ACTIVITIES  
'administração e atividades'
- VII - Error of sequence, partial translation with recognition of h:  
SICKLE-CELL ANEMIA  
' "sickle-cell" anemia'
- VIII - Error of sequence and unnecessary insertion of a rankshifted group:  
THE CHANGING NEEDS  
'mudanças nas necessidades'
- IX - Error of sequence and addition of an inadequate rankshifted group:  
A NEW UNIVERSITY TEACHING LAW  
'uma nova universidade de ensinamento de lei'
- X - Error of sequence and lack of a rankshifted group:  
A NEW UNIVERSITY TEACHING LAW  
'uma nova universidade ensinando lei'
- XI - Inadequate translation of (m):  
EARLY SCIENTISTS  
(os) 'antes cientistas'
- XII - Error of collocation: 37

THE THIN, FLEXIBLE DRUM

'o magro, flexível tĩmpano'

- XIII - Error due to formal similarity between English and Portuguese, with, or without error of sequence:

THE NEXT INSTANT

'neste instante'

- XIV - Singular for plural with addition of a deictic:

CERTAIN PATTERNS

'o certo padrão'

A full analysis of the two types of errors which concern this research is given in chapter 5.

A few comments on the kind of EL I Course offered by UFPB and its relevance to local situation will be produced in the next chapter.

## NOTES

<sup>1</sup>SINCLAIR, J. McH. A course in spoken English grammar. London, Oxford University Press, 1972. 266 p.

<sup>2</sup>Sinclair explains that his grammar tries to describe the structure of the English people use; it concentrates on the most common varieties of spoken and written British English. He claims that the terms deep and surface are fashionable in grammars: "Depth in a grammar concerns the way in which grammatical categories are related to the exponents" p.4.

a) Besides categories and exponents being closely related, the definition of categories involves a number of other categories - such as clause, nominal groups, predicator, mood, interrogation, number, concord; each has a definition which involves others, probably including subject. But definitions are not sufficient to make us recognize, for instance, the subject of (1) THE SPARROW HAS FLOWN AWAY. Sinclair says that we would have to change the verb tense from 'past' to 'present' and show the difference between singular and plural; here, another category has also been used - that of tense. b) Another way of showing what is meant by grammatical categories is the use of examples. Although it may not be clear what exactly is meant by 'predicator' or 'nominal group' a number of such examples and their analysis may be helpful.

(2) THE SPARROW FLEW AWAY

(3) DID THE SPARROW FLY AWAY?

Consider the example (4) MY FRIEND HAS WALKED FROM LONDON analysed as (5) MY FRIEND / HAS WALKED / FROM LONDON.

subject      predicator      adjunct

All the words in sentence (4) are new but there is no difficulty in the analysis. The examples of actual sentences (1) (2) (3) (4) and (5) are exponents: "words, letters, punctuation marks and so on that actually make up the language we write... They are physical events that grammar helps to describe." p.5.

This sort of grammar is surface grammar. "This one keeps as close to surface structure as possible. Every step that it might take in depth is measured against the amount of complication

and abstraction that would be caused." p.8.

The introductory part of his grammar presents his own concepts of grammar by way of justifying his approach. On pages 5 - 9 he shows all the involvement of the surface structure with the deep one in which the changes in meaning is conveyed by a semantic insertion of the roles played by the elements of a sentence: I (Interested Party) M (Mover) P (Pivot) and E (Entity); on page 6 the same deep structure is realized by means of four different sequences of the elements of a sentence. This complicated type of analysis points out the similarity of passive voice with another structure of 'copula plus complement', besides the influence of passive over other choices, mainly the one involving 'transitivity'; more complicated rules are needed for examples like:

(6) MY BROTHER LENT BILL A BOOK

(7) THE OLD MAN WAS HAPPY

He says that the subject of the passive cannot be the M (Mover)

as in (8) THE WORM WAS EATEN BY THE THRUSH

(Entity) (Pivot) (Mover)

Examples (9) and (10) do not describe the same event:

(9) JOHN SOLD THE CAR

M P E

(10) JOHN WAS SOLD THE CAR

I P E

"Their relation is like that between past and present, singular and plural, because the grammatical change alters the meaning in a predictable way." p.11. Other examples, such as

(11) THE TOMATOES GREW WELL

(12) THE TOMATOES WERE GROWN WELL

are the ones selected by Sinclair to illustrate the organisation of his book; he claims that (11) and (12) have no object and focus attention on the same item (TOMATOES). He says that "the effect of paring (11) and (12) is that the deep structural relations are mentioned but not used in the construction of the grammar. Instead, clauses with similar structure are contrasted in meaning." p.11.

These considerations were made to show the main

distinctions between Sinclair's systemic grammar and those which work with 'surface' and 'deep' structure concepts.

<sup>3</sup>We assumed that the approach of the Portuguese grammar that our students are used to consulting and referring to is similar to the way Systemic Grammar presents its hierarchical scale of units.

<sup>4</sup>SINCLAIR p.13. He has decided to use the term 'group' instead of 'phrase' because "it has many meanings already in grammars, and could be misleading."

<sup>5</sup>Ibid.

<sup>6</sup>Ibid. p.14.

<sup>7</sup>Ibid. p.133.

<sup>8</sup>Ibid. p.134.

<sup>9</sup>Ibid. p.209.

<sup>10</sup>Ibid. p.134. The example given was HE JUMPED OFF THE WALL in which OFF THE WALL operates at A in clause structure, as a prepositional group with which there is no nominal group to contrast with; from the previous examples we see that there are some relations between:

"1 a. He stayed three weeks

b. He stayed for three weeks"

for examples 1 a. and 1 b. are very similar in meaning; he says that there is no nominal group to contrast with HE JUMPED OFF THE WALL.

<sup>11</sup>Ibid. p.134-5.

<sup>12</sup>Ibid. p.143.

<sup>13</sup>CATFORD, J. C. A linguistic theory of translation. London, Oxford University Press, 1965. p.8-9; 78-9.

<sup>14</sup>The usual position of adjectives in Portuguese is after the noun; however, some adjectives may precede the noun with some change of meaning; as to the deictics, in Portuguese



they usually precede the noun. This subject is elaborated, with details, in BACK, Eurico & MATTOS, Geraldo. Gramática construtural da língua portuguesa. São Paulo, FTD, 1972. v. 1. p. 311-19. What Sinclair calls a nominal group the authors mentioned above call 'locução substantiva'. The headword in their concept is the nucleus (núcleo) in a 'locução substantiva'; the exponent of the nucleus is also a noun; as to the adjectives, they have been divided in 7 sub-classes according to their position or function within the 'locução substantiva'. From the examples presented on page 312, by BACK & MATTOS, we are interested in those adjectives that they have called 'qualificativos', 'especificativos' e 'pátrios' because it is their position in relation to the nucleus that has served as the basis for this work. Those authors say that the 'especificativos' are those which occur immediately after the nucleus, or the noun; the 'pátrios' - the ones concerning nationalities or origin - may come immediately after the noun or after the 'especificativos'; the 'qualificativos' are the ones which may come immediately before the noun or after it; if there are 'especificativos' or 'pátrios' in between, the 'qualificativos' come after the last adjective(s) after the noun.

It is not our purpose to establish a comparison between the classes and sub-classes of adjectives as presented by BACK & MATTOS and the delicacy scale at (m) as Sinclair has devised it; we have already seen that there is not a consistent way of classifying the exponents operating at e and n between the systemic grammar and the construtural one. Our main concern is to show that our students do not detect the headword and modifiers in an English ngp, or if they do so, they are not able to change (m) to the equivalent element in Portuguese which operates at (q), besides ignoring the sequence of the exponents in the rendered translations which usually present an awkward arrangement, not to mention those cases where comprehension has been completely obstructed; moreover, we know that the occurrence of some sort of adjectives before the noun, in Portuguese, is due to some stylistic reasons or it may also be ruled by semantic criteria; on page 315 BACK & MATTOS have quoted an example where the 'colour' adjective may occupy either (m) or (q) positions giving rise to different interpretations.



<sup>30</sup>Ibid. p.170.

<sup>31</sup>Ibid. p.173.

<sup>32</sup>Ibid. p.161.

<sup>33</sup>Ibid. p.162. On pages 164-7 Sinclair points out the variety of meanings concerning the mobility of colour adjectives and the classifying ones; he illustrates the possibility of attributing two different structures in A DRAMATIC PERFORMANCE - a) an exciting performance, or b) the performance of a play. As a) the structural elements are d ea h (in which ea stands for qualitative adjectives) and as b) the structural elements are d ec h (in which ec stands for classifying adjectives).

<sup>34</sup>As to the usual positions of adjectives in Portuguese we have already referred to BACK, Eurico & MATTOS, Geraldo. Gramática construtural da língua portuguesa. See note 14. We are interested in analysing the way our students have dealt with English nominal groups as to the class-shift from the structural element (m) in English nominal groups to its equivalent in Portuguese at (q), as well as their treatment given to the compulsory structural element h in the same nominal groups.

<sup>35</sup>CATFORD, p.25, 75-6.

<sup>36</sup>See Appendix 2.2.4. for a full list of errors.

<sup>37</sup>CATFORD, p.10. Collocation, as devised by Catford, is the 'lexical company' that a particular item keeps. In Portuguese 'magro' does not collocate with 'tímpano'.

## CHAPTER 2

## RELEVANCE OF RESEARCH TO LOCAL SITUATION

The students of English Language I Course generally enroll for this course in their first semester at the University. Later, in their undergraduate courses, they may take another English course as an optional discipline. However, their need for English as an auxiliary discipline for other school subjects is to be met from the very beginning of their academic life. Thus, English Language I Course is one of their compulsory disciplines, but their attendance at ESP (English for Specific Purposes) Courses which are offered by the DLEM to undergraduates, graduate students who intend to apply for a post-graduation course, or even to post-graduate students at the UFPB is optional. Post-graduate students at the UFPB usually have to sit for an examination in a foreign language before their enrollment in any post-graduation course; they are expected to be proficient in a foreign language since they have to read specialized literature in a foreign language. These students usually attend ESP Courses which are offered by the DLEM every semester. For instance, during the first semester of 1980 ESP Courses were offered to 167 graduate and post-graduate students; the graduate students belonged to courses such as Nursing, Mechanical Engineering, Physical Education, Food Engineering. The post-graduate students were attending courses in Medicine, Social Sciences and others. In the second semester of 1980, 1,162 undergraduate students have been enrolled for EL I Course; they have to attend EL I Course as a compulsory discipline, as they might also attend French Language I Course, or even German Language I Course, for

choice.

The preparation of our students for reading specific literature is one of the main purposes of the DLEM; it aims at providing students at any academic level with the ability to read technical texts so that they will be able to carry out their academic studies efficiently.

Thus, the main point in an English Language I Course and in any ESP Course is to train students in reading skills. This common aspect has already been mentioned in this work: the reading of technical texts has been one of UFPB students' needs to be satisfied.

In fact, the growth of the UFPB and the necessity for keeping pace with all the developmental needs required by the society to supply the needs of this same society are the main factors which have led the UFPB not only to expand the number of courses offered but also to improve the quality of those courses. ESP Courses have been the result of this development; we might also say that English Language I Courses were the first step towards the provision of ESP Courses for the graduate and post-graduate students. Nowadays the former have tried to reach the status of pre-ESP Courses on the assumption that our English Language I students will certainly feel the need to give continuity to their English lessons, since we all know that one semester of any foreign language course is not sufficient to remedy all the deficiencies of most of the newly-admitted university students, in relation to their ability to read technical texts.

It is the performance of our students in English Language Course I that may enable us to foresee the probable

areas of difficulties in reading texts which deal with the specific disciplines of their courses. Here, we feel the need to emphasize, once more, the main concern of this work: to detect some of the problems involved in the reading of technical texts, having as the material support the translations of those texts made in class. We assume that one of the main purposes of ESP Courses is to train students in reading English technical texts and that any programme designed for English Language Course I is to be seen as a basic course for further ESP Courses.

We have often referred to the reading of technical texts, however, we assume that the linguistic area of difficulties that we have been trying to detect might also be detected in non-specific texts; in dealing with texts which expounded content not linked to their specific academic studies, our students might also be faced with the same kinds of difficulties. Poor or unsatisfactory knowledge of a foreign language, English in this case, may block the understanding of a text, even if its content may belong to the main subjects of the students' course. We also assume that our students, as newly-admitted university students, are not capable of studying any text about any subject which may belong to their academic area, or field, without any difficulty; from experience we know that most students sometimes know the subject dealt with in a text and are able to infer the message; others may know the subject but admit that the information<sup>1</sup> that they are getting from the text is not in accordance with what they know about the subject; it may seem strange for people who are not familiar with this type of course that situations such as the latter may occur, but it is quite common to hear students saying that what they have been reading

in the text does not fit with what they know about the content. This has been one of the causes for this work: to detect some of the linguistic areas which might be blocking comprehension, so that a new approach towards certain linguistic areas in the reading of technical texts might be adopted in future English Language I Course programmes. Before doing so however, it is necessary to take a look at what the reading process involves, and will form the basis of the next chapter.

## NOTE

<sup>1</sup>I myself have underlined the word information.



## CHAPTER 3

## READING COMPREHENSION

3.1. Some lines of thought

Reading as it is viewed in EL I Course does not forcibly include the oral performance of our students so that intonation and pronunciation can be tested. In our specific case, reading is related to the ability to interpret the written medium of English as a foreign language. Silent reading is what generally takes place in EL I Course, since students are assumed to be trained to consult specific literature in English, concerning their major disciplines.

The problems involved in the process of reading are still open to investigation; although there is no general agreement on what is involved in the reading or decoding process, we intend to indicate some of the main lines of recent thought about that process.

Carver<sup>1</sup> sorts out the skills of the fluent reader as a base to make up a reading lesson; he views comprehension as linked to real-life activity, and he points out three particular features in comprehensive work: a) the development of reading skills; b) acquisition of content; c) expansion of language competence.

Among a great number of skills Carver has quoted:

"The ability to discover specific facts... to see the writer's point of view... to infer the meaning of unknown words from the context, instead of resorting to the dictionary... to see how one part of the text relates to

another... to follow an argument or discussion... to visualize what is described in words... to note the significance of such 'logical' expressions as HOWEVER, THUS, AND SO, THIS, HE, IN THIS WAY, FINALLY..."<sup>2</sup>

These skills, according to Carver, can be developed with the teacher's help, in accordance with the purpose of the course.

Carver emphasizes that reading in classroom situation should be as close to real-life activity as possible. He claims that reading without preparation is a real-life activity; a good reader knows how to cope with a difficult word as he meets it; he may ignore it, or guess it, make sense of it from the context, ask his neighbour, look it up in a dictionary or "read on in the hope that the word will turn up again and be clearer next time".<sup>3</sup>

From the translations rendered by our EL I students we might infer that they have not always succeeded in following all the steps above to smooth away some of their difficulties with ngps. When a ngp turned up twice in a text, some students translated it correctly in the second time that ngp appeared, while others maintained the first incorrect translation, or omitted its translation every time that ngp turned up; other inserted a part of the ngp in English giving rise to a partial translation, as in the translation of SICKLE-CELL ANEMIA (T2C) into " 'sickle-cell' anemia". Part of the ngp has been written between quotation marks so that the teacher might infer that those students did not find the Portuguese equivalent to 'sickle-cell', only.

Different from Carver's theory, which bases reading on a fluent reader's skills, Gardner states that:

"reading comprehension is not merely a function of capabilities within the reader. Some writers succeed in making themselves unreadable. There is a sense, therefore, in which reading comprehension rests on our ability to overcome the difficulties placed in our way by a writer..."<sup>4</sup>

but, says Gardner,

"to acquire adequate reading comprehension we need to come to terms with the special and unique forms of language, which writers tend to use".<sup>5</sup>

Gardner suggests that reading comprehension is more than

"the surface melody offered by the composer. To probe the underlying harmonies one needs a means of interpreting the detail of the score".<sup>6</sup>

That is to say, reading comprehension involves application of some form of analysis to the meanings of the superficial read, as an extension of the initial comprehension, besides the assumption that

"what a reader comprehends is as much a function of that reader's intentions as it is of an assumed reading competence".<sup>7</sup>

Depending on the reader's intentions the products of reading may present different levels of comprehension. A reader may read to obtain only a surface meaning, or he may reflect and pose critical analysis to his first impressions. Gardner also claims that

"no matter how levels of comprehension are analysed, however, it seems that an essential element is the interaction between the intentions of the reader and the 'meanings' which are available in the text. The outcomes of reading rest on: a) what the reader wishes to achieve, and b) his competence in utilizing

the printed text in order to extract the 'meanings' appropriate for his intentions".<sup>8</sup>

As to our specific case, EL I students need English as an instrument for further studies and ngps have proved to be the linguistic form which has blocked the reconstruction of meaning in the texts translated.

Gardner still says that the level of comprehension can be determined by psychological, intellectual, methodological and technical factors. Psychological factors can determine the degree of involvement between the reader and the text. The depth of understanding varies according to the reader's purposes, interest, or attitude in relation to the text. The quality of reading comprehension will also be affected by the reader's conceptual range:

"we have to know all about what we are reading about before we can understand it. Certainly, it is difficult to learn from reading unless we have already 'learned' before we come to reading".<sup>9</sup>

Moreover, the effectiveness of reading will be also influenced by the method that the reader adopts. He must be able to employ strategies which will permit him to exploit what comes ahead and what he has already scanned in the passage, so that mastery of the material can be achieved. The way some texts are produced can also affect reading comprehension.

"If reading is considered to be the reconstruction of meaning in the mind of the author (Goodman) then it follows that the author must adopt a mode of presentation which makes such meanings available to the reader".<sup>10</sup>

The ordering of the written material as well as the linguistic

forms of the message may be a relevant factor to make reading more or less accessible to the reader.

Assuming that our students were interested in the texts that they were studying, and that they had some knowledge of the subjects discussed in those texts, we are inclined to assume that methodological and technical factors have affected comprehension; their lack of experience in applying reading strategies to a foreign-language text and their inability to cope with ngp structure may have hampered the understanding of those texts.

Sloane<sup>11</sup> views reading as based on two skills; the first concerns the actual way we read and it comprises the macro-skills of reading: skimming - which refers to a quick reading to get the main idea; scanning - which refers to the locating of significant details in the text; and intensive reading - of whole or parts of the text. The employment of any of these skills depends on what you are reading and why you are reading.

The second kind of skill in reading concerns what we do while we are reading: the inferences we make, prediction of what is going to come next, the guessing of new words from context clues and the disregarding of new words or phrases. These are the micro-skills of reading and they interact with the macro-skills of skimming and intensive reading, but not with scanning since this cannot stand on its own because it must be preceded by skimming or followed by intensive reading.

Since Sloane claims that a factual text is unfavourable for inference-making,<sup>12</sup> we may assume that our students'

inability to guess new words from the context clues - and this has already been demonstrated through the translation of English ngps - might have been overcome by their assumed experience of the subjects presented in those texts studied in class. To this point, we have assumed that their experience of the subjects studied was still restricted, and that their lack of mastery of English ngp structure has handicapped their understanding of the texts. This assumption may also lead us to think over the adequacy of the texts studied in those EL I groups; closer attention to this aspect will be given in the last part of this work.

Although some writers have tried to set up the distinctions between reading and thinking as well as all the processes involved in comprehension, they have admitted that the high-level cognitive processes, the psychological ones and comprehension techniques have not been established yet.<sup>13</sup> It is in this area of relations between language and thought that the psychological approach to language is applied.<sup>14</sup> Basically, reading is one of the skills which can be studied within the problems which concern psycholinguistics: language acquisition and language performance.

Learning a foreign language cannot be entirely developed in the same way a child acquires his experience of language in interaction with perceptual and motor skills and cognitive abilities. However, reading comprehension, though it involves other areas of studies besides the linguistic area itself, is not in principle different from other kinds of learning. Corder says that

"it is the circumstances (learner, teacher and linguistic data) in which learning takes place that are different. It does not necessarily follow for that reason that the processes of learning are different".<sup>15</sup>

For our students learning a foreign language

"is a matter of adaptation or extension of existing skills and knowledge rather than the relearning of a completely new set of skills from scratch... We can conclude from this... that there are some fundamental properties which all languages have in common... and that when these fundamental properties have once been learned (through their mother-tongue manifestation) the learning of a second manifestation of language... is a relatively much smaller task".<sup>16</sup>

Reading has been classified as an observable physical act, just like all other language skills, but this characterization excludes reading in the receptive group of the two-division performance: the productive and the receptive performance. To read presupposes the ability to speak and hear,

"thus, the language teacher is concerned not with teaching speaking and hearing, etc. but 'speaking in French, or reading German or hearing Italian'... the teacher... extends these skills in some perhaps relatively superficial fashion".<sup>17</sup>

For Widdowson reading is not only receptive;<sup>18</sup> he has established some distinctions between the conventional notions which define the aims of language teaching courses by reference to speaking, listening, reading and writing, and the way language is realized in communication; those conventional notions can be represented as productive/active skills,

comprising speaking and writing, and receptive/passive skills, comprising listening and reading, when considering usage.<sup>19</sup>

In writing, the writer assumes the reader's role; it can be said to be receptive in the sense that he interprets what has been said before, he assesses how what has already been written and is being written will be received by the reader. If we regard reading as being receptive, consequently writing as use can be partially receptive, too.<sup>20</sup> In reading, the understanding of discourse involves not only the ability to recognize the meaning of words and sentences - which is referred to as 'comprehending' by Widdowson - but also the recognition of the value that those words and sentences take on in association with each other as elements in a discourse.

"Reading in this sense is a kind of accomplishment whereby a discourse is created in the mind by means of a process of reasoning. In this respect, the ability to read and the ability to write are the same and it is neutral with regard to production or reception".<sup>21</sup>

This ability to create or recreate discourse, common to both writing and reading as communicative activities, is called 'interpreting'. Interpreting, says Widdowson,

"... is a psychological process which, unlike 'talking', is not realized as actual social activity. ... it is covert activity in the mind." <sup>22</sup>

Another aspect involved in language skills is that concerning reciprocal and non-reciprocal activities; the former take the form of exchange between two or more participants; non-reciprocal activities refer to psychological activities which are not made overt through physical or social activity. Interpreting is the



highest level non-reciprocal skill for

"it is the ability to process language as communication and it underlies all language use. You cannot talk or correspond without interpreting but you can interpret without talking or corresponding".<sup>23</sup>

Widdowson also states that

"the ultimate aim in language learning is to acquire communicative competence, to interpret, whether this is made overt in talking or corresponding or whether it remains covert as a psychological activity underlying the ability to say, listen, write and read".<sup>24</sup>

As to our students' problems in dealing with ngps, we infer that they are at a stage at which the recognition of the meaning of words and groups of words is necessary so that they can consequently interpret correctly the message conveyed. Widdowson says that the "communicative abilities embrace linguistic skills but not the reverse".<sup>25</sup>

From this statement we conclude that our students' 'comprehending' skill may be one of the factors which is blocking comprehension, and the interpreting ability has not been properly acquired yet.<sup>26</sup> However, we are not entitled to say that our students are not able to recognize the role which words or groups of words may have as elements of a particular piece of discourse. Reading depends on comprehending but comprehending does not imply the recognition of the signification of a written sentence in the context of a particular piece of discourse. Widdowson claims that interpreting is not dependent on comprehending:

"you can comprehend the signification of a

written sentence without recognizing what it counts as in the context of a particular piece of written discourse".<sup>27</sup>

If interpreting is considered as a non-reciprocal skill, also defined as "the psychological process of understanding which is not made overt through physical or social activity"<sup>28</sup> we are bound to say that one of the practical and material ways to help students to interpret or to develop that interpreting ability is by means of developing the comprehending skill; since we cannot guess what is going on in our students' mind, a palpable way to discover any possible interference with interpreting is just through an overt manifestation such as the one achieved by our students when they read a text in a foreign language and are required to write down an equivalent text in their mother tongue. Interpreting, as Widdowson puts it, will always remain an area where no direct and material incursion can be made, although he says, and we also agree, that interpreting underlies all language use, and it is also considered, as we have already mentioned above, the highest level skill.

As a pedagogical suggestion Widdowson says that

"language as use might most effectively be taught by associating the teaching of language with other subjects in the school curriculum".<sup>29</sup>

This means that what has to be done is

"to associate the communicative abilities, previously related to language skills operating on their (students') own language, to the linguistic skills related to the foreign language".<sup>30</sup>

Assuming that our students have some problems with some of the linguistic skills related to the foreign language, that association cannot be accomplished successfully. If we assume that our students have acquired communicative abilities in their own language, Widdowson suggests that teachers should

"remove these abilities from a dependence on linguistic skills in the mother tongue and associate them with linguistic skills in the foreign language. We thereby represent (without misrepresenting) foreign language learning not as the acquisition of abilities which are new but as the transference of the abilities that have already been acquired into a different means of expression".<sup>31</sup>

Since this transference implies an association of communicative abilities, already acquired, with linguistic skills in a foreign language, English ngps may be one of the factors which have been blocking the transference, for 'comprehending' is one of the linguistic skills where our students need some help. The way our students have dealt with English ngps in the texts which they translated into Portuguese has proved that ngps are an aspect of the 'comprehending' skill which needs special attention.

Although we recognize the importance of describing the psychological processes which take place in reading, we are inclined to view reading as one of the well-known language skills to be practised in classroom situations. At present, the circumstances under which reading is achieved in EL I Course are rather different, since one of the purposes in these courses is to develop the students' ability to understand what they read in English. Thus, comprehension is to be seen as the final product of reading.

To apprehend the meaning is a means of coming to comprehension; we can only apprehend that which is connected to what we know. The actual comprehension of a text requires the ability to associate groups of words, grammatical structures, ideas or facts implicit in what has been expressed. Therefore, if our students are not well-acquainted with certain types of groups of words and the structural elements which make up those groups, comprehension cannot be attained.

The fact that most of our students presumably know the subject being dealt with in a technical text has proved to be an insufficient factor to overcome the linguistic difficulties posed by their poor knowledge of English; however, as we have mentioned before, in chapter 2, most students are aware of their inability to interpret what has been transmitted in those English texts, because they are not able to decode some useful graphic information available in those texts.

If we assume that there is motivation on the reader's part, his ability to read depends to a great extent on an efficient interaction between his linguistic knowledge and his knowledge of the world. If one of those types of knowledge is poor, reading may be reduced just to the recognition of the letters, if they belong to the roman alphabetic script.

### 3.2. The psychological processes of receptive behaviour

Seeing reading as receptive performance Corder<sup>32</sup> lists some of the processes which theoretically aim at comprehension. Firstly he states that recognition is the process which

"extends beyond the level of sounds, intonation patterns and rhythms of language to groups of sounds or lexical words. We also store object-hypotheses of words and perhaps groups of words which habitually occur together".<sup>33</sup>

Such a recognition becomes possible - linguistically speaking - because

"the sentence of a language can be described in terms of a finite set of 'rules'... This means that we must use 'rules' rather than lists".<sup>34</sup>

This economical way is the one by which we are able to recognize sentences since it takes the least possible 'mental' storage space.

The next phase concerns sampling "the incoming data and, on the basis of our sampling, predict the structure of the utterance and act accordingly".<sup>35</sup> This ability to anticipate, or predict, is a fundamental skill in language use and language learning, and it is said to comprise

"a very big part of what we have called linguistic competence... And any ability to anticipate or predict is based on a knowledge of rules. That is why language is often called 'rule-governed' behaviour".<sup>36</sup>

Thus, we need to internalize the grammatical and the lexical rules; the latter have to do with the semantic structure of the language.

"Identification is (therefore) the process of recognizing utterances as grammatically and semantically well-formed".<sup>37</sup>

Understanding is the psychological process which presupposes identification. Besides the identification of utterances as

well-formed according to the rules of the language, understanding also involves the perception of the function of the utterance in its context; it involves

" 'understanding' the situation as well, and this relates the understanding of language to an understanding of the world".<sup>38</sup>

It is in the psychological processes of identification that we might tackle a probable cause of our students' errors in their interpretation of English ngps, for it is connected

"With grammatical/semantic competence, formation rules and acceptability".<sup>39</sup>

Since understanding presupposes identification, the former cannot be attained if there is some sort of blockage along the scale of psychological processes of receptive behaviour. On the other hand, it is our students' understanding of the situation that makes most of them conscious of the errors that they have made in contexts which are familiar to them.

We might assume that they have failed in internalizing some 'rules' related to the formation of English ngps at the stage of the process of identification in their receptive foreign language performance. This failure might be due to their mother-tongue interference concerning, in this particular case, the order of the structural elements of English ngps, since in Portuguese, the sequence of those elements usually follows a different order or arrangement.

"The assumption, then, is that some of the rules they already know are also used in the production and understanding of the second language. This is what is meant by 'transfer'; learners transfer what they already know about performing one task to performing another or

similar task".<sup>40</sup>

This transference, as Corder calls it, may cause the errors made in the interpretation of English ngps; most of our students continued to apply the mother-tongue rules where new ones were needed. In translating EDUCATIONAL POLICY (TIC) two students interpreted the exponent of h - POLICY - as being the exponent of (q) in their translation. Thus, the English ngp EDUCATIONAL

POLICY became 'educação política', by one student, and 'educação  
 h                      h                      q                                      h  
policial' by the other student. On this account what has to be  
 q

learned is what is different between the mother tongue and the foreign language.<sup>41</sup>

After having pointed out the complex psychological processes of receptive behaviour, we consider the description of 'reading comprehension' a task to be performed not only by psychologists but also by experts in various fields of human communication. Devising all the stages in the hierarchical processes of receptive behaviour, Corder states that

"it is virtually impossible to decide whether 'understanding' (and ideation) are specifically linguistic processes or not... They have not yet been even provisionally defined in any psychological theory".<sup>42</sup>

To sum up, reading comprehension does not belong entirely to the field of applied linguistics, and more specifically to language teaching. The foreign language teacher's contribution has been stated as follows:

"he works on the principle that what they (the learners) want to say can be said in the

target language".<sup>43</sup>

As this work proposes a practical contribution to EL I Course in their treatment of a linguistic area which has proved to be difficult for most of our students, a profound exploration concerning the nature of 'comprehension' is far from being our objective.

At no moment have we tried to limit or overlook the complexity which involves reading and comprehension as a whole. As we consider comprehension, from a practical point of view, the ultimate purpose in EL I Course, we have been engaged in detecting one of the problems which have been interfering with comprehension in the process of reading English texts.

Foss and Hakes<sup>44</sup> distinguish three phases as related to comprehension: a) the apprehension of lexical content; b) the apprehension of syntactic structure, and c) an integration of a) and b) in a structure of pragmatic and semantic representation. In a) the sentence is the stimulus to recall the information about the semantic characteristic of the word; this phase is followed by the apprehension of the syntactic structure where the lexical items lie. b) results from inferences based on graphic and lexical representations; c) stands for the mental representation of what has been apprehended in a) and b).

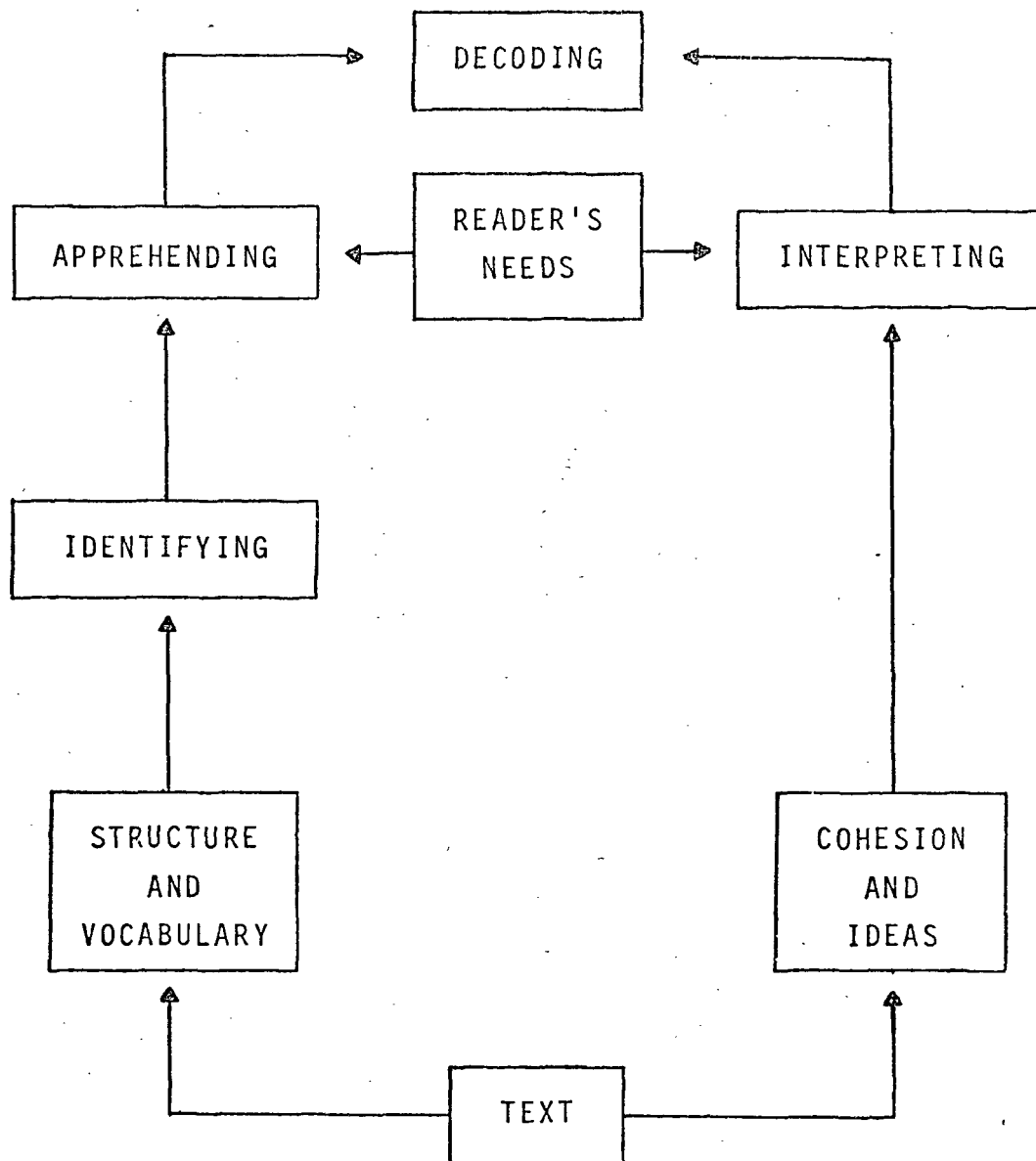
Apprehension may also be described as comprising three levels: a) structural signification; b) intentional signification; c) motivational signification. Structural signification involves propositions and depends on syntactic structure and lexical content. So far, all the relevant information is not explicit in the text. Intentional signification



involves requests, which are not necessarily involved in the utterance; it requires inference whose resultant label might be 'presupposed signification'; the sentence would give us the literal signification only. Motivational signification involves a choice, from the addresser's part, which led him to a certain type of utterance. This choice, for instance, might be based on differences of social status.

Assuming that comprehension is the product of these three processes as a whole, we may say that our students have not even been able to apprehend what is explicit in the text, or its literal signification, not to mention what is implicit or presupposed. If there is any misapprehension in one of these phases related to comprehension, it is implicit that comprehension as a whole cannot be accomplished.

From all the lines of thought which have been mentioned above, we might devise an illustration of the factors and processes which are involved in the reading of texts; decoding would be the top of a scale which might be reached by means of the apprehension and identification of structures and vocabulary, together with the interpretation of the cohesive links and ideas transmitted in the text. The students' background and strategies would influence the apprehending and interpreting processes which would comprise the decoding process. Any difficulty posed by structure, for instance, would certainly interfere with the whole process of decoding.



Since our students are not able to identify the structural elements of English texts, consequently they are not able to understand what they read in their English texts.

If apprehension of syntactic structure, according to Foss and Hakes, is a prerequisite for the integration of this with apprehension of lexical content, then inability to identify the headword and its concomitant modifiers must be a main factor of interference in reading comprehension.

In chapter 5 we shall present examples of how

students' problems were involved in ngp structure, and how those problems have affected comprehension.

Translation, as one of the usual techniques applied in EL I classes, has been used in this dissertation as a means of detecting some problems posed by ngps and the consequent interference with comprehension.

## NOTES

<sup>1</sup>CARVER, David. Reading comprehension. Is there such a thing? English Language Teaching Journal, 32 (4): 291-7, July, 1978.

<sup>2</sup>Ibid. p.294.

<sup>3</sup>Ibid.

<sup>4</sup>GARDNER, Keith. Reading comprehension. In: BRITISH COUNCIL. English Teaching Information Centre. The teaching of comprehension. London, 1978. p.68.

<sup>5</sup>Ibid.

<sup>6</sup>Ibid.

<sup>7</sup>Ibid. p.70.

<sup>8</sup>Ibid. p.80.

<sup>9</sup>Ibid. p.75.

<sup>10</sup>Ibid.

<sup>11</sup>SLOANE, R.J. A skill-based approach to the comprehensive lesson. IATEFL Newsletter, (65):44-7 Oct.1980. See also SCOTT, Michael. Reading comprehension in English for academic purposes. A paper given at the National Conference of Coordinators of the 'Projeto Ensino de Inglês Instrumental em Universidades Brasileiras'. Nov. 1980 p.2. (unpublished material).

<sup>12</sup>SLOANE, p.44-5.

<sup>13</sup>SIMONS, Herbert D. Linguistic skills and reading comprehension. In: WILSON, Lois Irene. Reading in ESOL classroom: a technique for teaching syntactic meaning. TESOL Quarterly 2 (3):260.

<sup>14</sup>CORDER, S. Pit. Introducing applied linguistics. Harmondsworth Penguin, 1973. p.71. "The psychologist is concerned with the relations between the formal system of language (the code) and

the conceptual system (or cognitive structure) of the individual, i. e. language as a symbolic system".

<sup>15</sup>Ibid. p.113.

<sup>16</sup>Ibid. p.115. Corder always refers to 'second language' which stands for our 'foreign language' concept in this work.

<sup>17</sup>Ibid. p.116.

<sup>18</sup>WIDDOWSON, H. G. Teaching language as communication. Oxford, Oxford University Press, 1978. p.61.

<sup>19</sup>Ibid. p.58. He illustrates the distinctions between speaks as usage verb and as a use verb, with some examples in: She speaks clearly or She speaks slowly and distinctly; in these examples he is using the term speak to refer to the manner in which language is manifested; in 'She speaks frankly about her marital difficulties' he is using the term to refer to the manner in which language is realized as communication.

<sup>20</sup>Ibid. p.63

<sup>21</sup>Ibid.

<sup>22</sup>Ibid. p.64.

<sup>23</sup>Ibid. p.66.

<sup>24</sup>Ibid. p.67

<sup>25</sup>Ibid.

<sup>26</sup>Ibid. For Widdowson linguistic skills comprise speaking, hearing, composing and comprehending; those refer to the way in which the language system is manifested as usage; communicative abilities comprise saying, listening, writing, reading, talking, corresponding and interpreting, which have to do with how the system is realized as use.

<sup>27</sup>Ibid. p.66.

<sup>28</sup>Ibid.

<sup>29</sup> Ibid. p.74.

<sup>30</sup> Ibid.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid. p.115-6.

<sup>33</sup> Ibid. p.119.

<sup>34</sup> Ibid.

<sup>35</sup> Ibid. p.120.

<sup>36</sup> Ibid. p.121.

<sup>37</sup> Ibid.

<sup>38</sup> Ibid. p.122.

<sup>39</sup> Ibid. p.123.

<sup>40</sup> Ibid. p.132.

<sup>41</sup> We have mentioned the problem in chapter 1. One of the types of errors that we have analysed in this work is the wbt type, that is to say, these students have identified the boundaries of the English ngp but they have not been able to replace the English structural elements in a ngp by the equivalent ones in Portuguese. They have altered the message conveyed in that ngp because they could not identify the headword of the English ngp and perform the adequate class-shift; the exponent of h in the English ngp has become the exponent of (q) in the Portuguese translation rendered by those students, instead of maintaining the same headword 'política' in Portuguese and perform a class-shift at (m) to (q) in Portuguese, so that we might have 'educacional' operating at (q) in the Portuguese equivalent 'política educacional'.

h                      q

<sup>42</sup> CORDER, p.125-6. Here we have equate understanding with comprehension.

<sup>43</sup>Ibid. p.126. We want to make it clear that 'target language' in this work concerns, in fact, our students' mother tongue, into which students have translated English texts; English is, then, the source language, and Portuguese, the target language. This, however, does not invalidate Corder's statement quoted above.

<sup>44</sup>FOSS, Donald J. & HAKES, David T. Psycholinguistics: an introduction to the psychology of language. Englewood Cliffs, Prentice Hall, 1978. p.99-101.

## CHAPTER 4

## THE VALUE OF TRANSLATION AS A TESTING INSTRUMENT

It has already been noted that translation plays a substantial role in the teaching of EL I classes at the UFPB, where the students are studying English as a means to other ends than those of a normal Humanities course.

The usual procedure is for the teacher to read through the texts, which are normally related in a general way to the students' main disciplines, drawing attention to difficult vocabulary items and points of grammar, after which the students are divided into groups to make a translation of the text. The teacher is then able to go from group to group offering help where necessary.

As the whole purpose of this dissertation is to examine the errors that students tend to make in this kind of translation exercise, it is perhaps necessary to justify the use of translation in this way. Since the days of the reaction against the Grammar-Translation approach to teaching languages, the word translation has itself come into disrepute and thus may need to be defended here.

No one is inclined to support Grammar-Translation as a teaching method these days, but the use of translation as an evaluation procedure is a different matter. There are of course, many reasons for testing and various ways of doing it. Corder<sup>1</sup> emphasizes several aspects. He notes that, for instance, objective tests are usually intended to measure the learner's "grammatical competence rather than his global communicative



ability." <sup>2</sup> Subjective tests, on the other hand, are intended to assess "the appropriateness of the use of the language," <sup>3</sup> he suggests, while pointing out that "appropriateness cannot yet be reduced to rules and consequently judgements about it are necessarily subjective." <sup>4</sup>

Again, tests may be categorized according to a more specific purpose. Achievement tests, Proficiency tests, Aptitude tests, Placement tests and Diagnostic tests all have their own particular validity, and it is the last of these with which we are concerned. We want to know the areas in which our students are regularly having difficulty. At the UFPB we have noted that one of these areas is in comprehension of written texts associated with the students' own disciplines, so we require a testing instrument that will indicate exactly where the difficulty lies. Comprehension is a broad category and there are a number of methods of testing it. Cloze procedure, for example, which operates by the deletion of every (e.g.) 5th word from a text, can be used to measure the students' ability to infer what the missing words are by reference to the context. The limitations of this approach, for our purposes at least, are pointed out by Raphael Gefen:

"The only limitation at the moment... is that the missing item is still at word level and no higher; to omit longer units such as phrases would introduce too many complications in the objective (or at least 'agreed') scoring of a foreign language test." <sup>5</sup>

The students' knowledge of how two or more words may come together to form a ngp would be only rarely tested by this procedure, and we are, of course, concerned with ngps of two or more words.

Similarly, Information Transfer exercises, True or False questions, Column-Matching and so on are all acceptable ways of testing types of comprehension, but within the context of the UFPB courses, they are inadequate. They do not offer the kind of on-going diagnostic type of testing that we require. Translation, on the other hand, goes a good deal of the way towards providing this.

We must accept that in what is, after all, an ESP situation, there is bound to be a mix of interests and skills. Basically the students are interested in the content, while the teacher is primarily concerned with teaching the language; the student also tends to know more about the content than the teacher, except at the very simplest levels, and the teacher obviously is more confident with the language. This reveals itself at the UFPB in several ways. Many students are aware that the translations they have made do not reflect what they know to be true of the content of the text or their background knowledge of the discipline. At the same time they tend to translate the words in linear sequence in many cases. Surely there is a basis here for discussion of the relationship between the true content of the passage and the linguistic realization of it.

The advantages of translation as a diagnostic testing instrument seem to us to include:

a) it gives the teacher a clear view of those areas requiring remedial work;

b) even if the teacher's knowledge of the specific subject is limited, his familiarity with the language will enable him to pinpoint such difficulties as those related to the

identification of the structural elements in a ngp;

c) students are not able to avoid difficult areas of grammar -as it is claimed they can do in subjective tests<sup>6</sup> - since they are committed to an authentic piece of written language in its entirety. Even omissions in a translated text can be useful, as they point to areas of difficulty in their own way.

We must not lose the sight of the fact, either, that translation as used at the UFPB is by no means an unsupported activity.<sup>7</sup> It is also useful to remember that translation involves the use of mother tongue by both students and teacher, and as both are normally non-native speakers of English discussion of the more difficult aspects is facilitated. Nevertheless, the language teacher will still need to be familiar with the concepts necessary to assess and isolate specific types of errors.<sup>8</sup>

Our justification of translation at the UFPB, then, may be summed up as follows. We feel that evaluation is an integral part of teaching. There is often a need for summative, end-of-course, evaluation, as a means of establishing the success or otherwise of teaching techniques, course books, students themselves, and so on; but this is not our primary concern. What we require is some form of on-going, formative evaluation that we can employ throughout the course as a way of monitoring specific language problems. If the purpose of an activity affects the content and the content in turn affects the techniques employed, then translation would seem to be the most suitable technique for our purpose.

## NOTES

<sup>1</sup>CORDER, S. Pit. Introducing applied linguistics.  
 Harmondsworth Penguin Education, 1973. p.358.

<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid.

<sup>5</sup>GEFEN, Raphael. An experiment with cloze procedure. In:  
English Language Teaching Journal, London, 33(2):122-6. Jan. 1979  
 p.125-6.

<sup>6</sup>CORDER, p.367-8.

<sup>7</sup>Translation is usually followed by other types of exercises, mainly objective ones, and it is amazing to see how students manage to give correct answers (provided the tests are to be answered in English but not in Portuguese); so far, the conclusion most teachers have drawn from this fact is that students know how and where to find the answers in the text, even if some or most of them feel insecure as to the message they have got from the text. Here, once more, one feels the need for more and other types of testing instruments to elucidate the real problems and difficulties; our students should not be encouraged to find the answer in the text and simply re-copy them in the spaces left in any exercise, or simply to pretend that they are able to answer some questions, based on the text, by re-copying whole sentences, or even clauses exactly as they are in the text. Instead, some students are asked to provide their answers in Portuguese so that teachers can better evaluate students' understanding of the text.

<sup>8</sup>In dealing with the translation of English texts teachers are also expected to be familiar with the concept of 'shifts' as devised by Catford, in CATFORD, J.C. A linguistic theory of translation. London, Oxford University Press, 1965. p.73-82, and the concept of transposition according to AYORA, Gerardo Vázquez.

Introducción a la traductología. Washington, D.C., Georgetown University Press, 1977. p.266-89, and by VINAY, J. P. & DARBELNET, J. Stylistique comparée du français et de l'anglais. Paris, Didier, 1972, p.96-101. According to these authors a class of words in a language may be replaced by other class of words in another language without any interference with the meaning. This can be better understood if we try to translate HE SHELTERED HIS CIGARETTE WITH HIS CUPPED HAND or HE MERELY NODDED into Portuguese. We have been aware of the possible shifts in translation so as to avoid marking a mistake, or an error where there is not one. In text number 9 (T9P) administered to the Physics Group, we have the ngp DUSTY ROOM which has been translated as '(na) poeira da sala' by

m                      h    h

some students, an example of transposition in which the modifier DUSTY operates at h in its equivalent Portuguese ngp, without interfering with comprehension; an adjective in English has been replaced by a noun in Portuguese. Although the students who managed to do this class-shift may have done so by guessing, or just by following the sequence of the elements in English and achieved their translation into Portuguese without interfering with comprehension quite by accident, we have born in mind that the most important point is to verify whether that 'shift' has changed the meaning of the ngp in relation to the context in which it has occurred.

<sup>9</sup>CORDER, p.360.

## CHAPTER 5

## RESEARCH UNDERTAKEN

5.1. Procedure

To collect information about some problems which might be hampering comprehension of English technical texts studied by EL I students, we decided to make use of translation as one of the most usual techniques employed in EL I Course.

Our choice of translation as the vehicle which might give us the chance of finding out some sorts of problems faced by EL I students was based on our colleagues' and our own experience with the rendered translations of some paragraphs, as one of the parts in EL I monthly tests. Those paragraphs were taken from texts already studied in class and usually displayed a different arrangement of clauses, or their structural elements, so that the rendered translations did not result in a mere copy of the translation made in class. Irrespective of the fact that those short paragraphs had been extracted from texts already studied in class, some kinds of errors still persisted. In fact, translation in class has been preceded by some comments on the text, however, those comments concern what the teacher thinks to be difficult, either grammatical points or vocabulary, or both; students, in turn, may have their doubts clarified while they work on the text in groups, or when their teacher checks the translation of the whole text.

Sometimes teachers include translation of unknown passages in the monthly tests. As those passages have not been studied in class, students are allowed to consult dictionaries, just as they do when they are working on a new text in class.

The results have shown that some types of errors still occur, and the most common one is related to the way students perceive ngps formed by two or more words.

Our main concern has been to concentrate our research on the problems posed by ngps as reflected in EL I students' translations. The first step taken to gather actual and useful information about areas of difficulty in the translation of texts administered to EL I students was to change the usual sequence of comments on grammatical points and vocabulary followed by the translation. The text was usually read by the teacher, aloud, while students followed the reading silently; then, they started translating the text, either in groups or individually. The teacher's help was limited to information concerning the translation of isolated words, that is to say, it equalled the same sort of help which students might get from a bilingual dictionary. Disagreement among the members of a group as to a certain aspect of translation often occurred and as a result members of the same group did not always render identical translations. On several occasions one group rendered as many different translations as the number of members in that group.

After the groups had finished their translations, they were handed to the teacher; each student, or each member of a group, usually provided two copies of the same translation so that one of them might be kept in the teacher's possession.

The translation of the whole text was followed by comments on vocabulary, grammatical points, exercises and questions devised to test students' comprehension of the text and reinforce some important grammatical aspect.

As the length of the texts translated varied, the exact amount of time spent on each translation could not be determined, however, the average was three texts a month. In EL I Course students have five classes a week and each class lasts fifty minutes. The total number of classes per semester is 75 in each group.

At the end of each month students did their regular monthly test, and, since we intended to gather enough evidence of the problems involved in the translation of English texts, one point was added to the number of points obtained in the monthly test. That was an attempt to keep them interested in providing the translations regularly. It is important to emphasize that students are not obliged to produce the translations of every text studied in class; they are required to do so but not forced. They recognize translation as one of the procedures to be used in EL I Course, and they also know that in their monthly tests they usually have to translate short passages as part of the evaluation process applied to EL I Course groups.

Our decision to take translation of the texts administered in class rather than the short pieces of translation required in monthly tests in order to comprise the corpus of our research was due to two aspects: first, the translations of the texts would give us a more comprehensive view of the kinds of problems posed by ngps than the limited possibilities imposed by the very length of the short passages to be translated in four monthly tests; moreover, we would like to gather a relevant number of results so that they might be evaluated by statistical techniques; with longer passages students might have the



opportunity to infer the correct meaning of a ngp from a broader number of clues provided by the text as a self-contained unit; the translations achieved in monthly tests might also give rise to distorted results due to such factors as nervousness which tests sometimes cause in students with resulting interference with their performance; second, the results of this research should reflect the actual problems of students in relation to ngps in an authentic situation: translation as a usual procedure in EL I classroom situation.

After reading the translations rendered by each student, a selection of all ngps where errors had been made was produced; under each ngp the wrong translations attributed to it were copied with the number of students who had made them beside each type of wrong translation. For example, in T7P we had the ngp NATURAL UNITS which was translated as:

(... NO NOTION OF) NATURAL UNITS (OF RADIANT ENERGY... )

1. (movimento) natural de uniões	4 students
2. naturais (movimentos) de unidades	3 students
3. (mudança) natural de uniões	4 students
4. junção natural	1 student
5. (energia radiante de) uma unidade natural	9 students
6. (noção) natural (de energia radiante)	1 student
7. natureza de uniões	1 student

In numbers 1, 2, 3 and 6 we noticed that elements of another ngp had been inserted; students had formed new ngps in Portuguese using elements of the ngps which surrounded NATURAL UNITS. They had not maintained the sequence of the English structural elements, namely (m) and h, as one of the characteristics of the word-bound translation type of error - referred to as wbt -

which we intended to detect in this research; only number 7 interested us because it clearly showed the same sequence of the English exponents, NATURAL= 'natureza' - UNITS= 'uniões', besides the student's attempt to insert a rankshifted prepositional group - 'de uniões' - where it was completely unnecessary. Numbers 4 and 5 were also ignored in this research since they did not reflect the interference of the sequence of the English exponents with the rendered translation into Portuguese.

We have listed several types of errors made in ngps so that the problems involved in the translation of English ngps might be considered as a fact; however, in this research, only those errors which show the interference of the sequence of English ngp exponents and that same interference plus an inadequate insertion of a rankshifted group, (irg) as in number 7 above, have served our purposes.

## 5.2. Students and texts applied

Besides intending to find out whether the incidence of wbt and irg errors in ngps was relevant in face of other types of errors, and whether the length of ngps had any relation to the number of those errors, we also needed to verify whether the problems posed by ngps were only restricted to certain types of texts considered as non-specific to students' major disciplines, or whether the fact of dealing with texts related to their own academic field would minimize those problems. Thus, we chose two groups of newly-admitted undergraduates of different academic areas: one of Nursing students and the other of Physics students.<sup>1</sup>

The number of students enrolled in the Nursing Group was 40, and 26 in the Physics Group.

In the Nursing Group only two students were not new ones; they were both senior students who had not taken their EL I Course, yet. In the Physics Group all students had just done the university entrance examination.

The selection of individual students to form both groups was done by a normal process of enrolment at the UFPB. EL I classes are usually formed by students sharing the same field of studies. In both groups students were about the same age. Their social, cultural and economic background has not been our main concern here; as we mentioned above, we took these two groups of students just as the resultants of the common process of enrolment; our choice is related to their academic areas, only. It was a random choice as to their social, cultural and economic background. The inclusion of students' data concerning their background in our research would not have probably added any relevant information as to students' performance besides the one that is commonly expected from those types of data: students belonging to a high or upper-middle class are the ones who generally perform better.

During the semester in which translations were collected, the attendance of students who succeeded in finishing their course was practically 100%. In the Nursing Group 38 students attended the whole course and only two students dropped out; in the Physics Group 24 students finished the course while two gave up well before the end of the semester. Thus, the translations made by those students who did not finish the course

were not included in the ones which form the corpus of our research.

Besides the common nervousness which students usually show during the period in which they are overloaded by monthly examinations of other subjects, the rhythm of the classes was always normal, and students' interest in their EL I Course activities may be considered as satisfactory.

The Nursing Group managed to translate 14 specific texts while the Physics Group translated 12 specific ones. Before applying the specific texts both groups translated two non-specific texts so that the results obtained from the translation of the texts in the latter might be compared with the results obtained from the former.

Although the specific texts for the Nursing Group were different in content and in vocabulary from the ones for the Physics Group, we assumed that the students' knowledge of the subjects discussed in the specific ones would compensate for some probable linguistic difficulty so that a comparison between the results obtained from specific and non-specific texts could be made by means of statistical tests to reveal the degree of some possible discrepancies between the individual performance of Nursing students and Physics ones.

Texts to be studied in EL I Course are established by the DLEM (Department of Modern Foreign Languages) which also provides the copies to be distributed to students. The application of non-specific texts before the specific ones is considered as a means of introducing students to the procedures which characterize EL I Course classes, namely, the reading of fairly

long passages, exploitation of difficult linguistic aspects, translation of the text, written questions to assess students' comprehension of the text and a few objective exercises devised to test grammatical subjects designed for each text.

The non-specific texts, here referred to as TC, were studied by both groups at the beginning of the first semester of 1979. EDUCATION IN BRAZIL was the first to be applied; it was followed by RACE AND HEREDITY, the second non-specific to be studied. Both texts, which were laid down by the DLEM, dealt with subjects which can be said to be known by students of any academic area. Although RACE AND HEREDITY is concerned with genetic aspects, the subject in itself fits in with the biology programme which students have to study for the university entrance examination. In this way, the subjects of both non-specific texts can be claimed, at least optimistically, to be included in the students' high-school programme.

The specific texts applied to the Nursing Group totalled 14, and the order of their presentation in class was as follows:

1. THE NERVOUS SYSTEM
2. LATEST IN HEALTH AND MEDICINE
3. (No title; it can be referred to as LYMPH DRAINAGE SYSTEM text)
4. ACUTE RESPIRATORY FAILURE (From Current Therapy, 1975. Section 2, p.86)
5. CYSTITIS
6. TREATMENT OF ACUTE RENAL FAILURE
7. LIVER AND BILIARY TRACK
8. BRONCHITIS (From Merck Manual of Diagnosis and Therapy, 1975. p.1306)

9. HABITUAL ABORTION (From Current Therapy, 1975. p.716)
10. PLACENTA PREVIA
11. PYELONEPHRITIS (From Current Therapy, 1975 p.480)
12. ACUTE RENAL FAILURE
13. DYSPEPSIA
14. CALCULI <sup>2</sup>

The content of all those texts was related to the Nursing students' subjects of some disciplines that they were taking that semester. This fact was confirmed by some students of that group when they were asked about their knowledge of the subject dealt with in those texts; students taking their first university semester at the Medical School study the systems of the human body. However, we are not sure whether students were studying the pathology related to those systems simultaneously with the presentation of the texts in class. We can only infer that by the end of that semester most problems concerning the topics of the texts should have already been studied by those students.

The general impression was that the subjects dealt in the English texts had not been discussed in their classes of pathology before or by the time of the presentation of those texts in EL I classes yet. <sup>3</sup>

The Physics Group translated twelve specific texts in the first semester of 1979. They were presented in class according to the sequence below:

1. ELECTRIC MOTORS
2. MATERIALS
3. CORROSION

4. CONCRETE
5. CAN LIFE EXIST ON THE PLANETS? (Part one) (From chapter VII of THE UNIVERSE AROUND US, by Sir James Jeans, F.R.S.)
6. CAN LIFE EXIST ON THE PLANETS? (Part two)
7. THE QUANTUM THEORY OF RADIATION (Part one) (From chapter VII of AN APPROACH TO MODERN PHYSICS by E.N. da C. Andrade)
8. THE QUANTUM THEORY OF RADIATION (Part two)
9. PARTICLES OR WAVES? (From THE MYSTERIOUS UNIVERSE by James Jeans)
10. PARTICLES OR WAVES? (Part two)
11. THE THEORY OF CONTINUOUS CREATION (From chapter V of THE NATURE OF THE UNIVERSE by Fred Hoyle)
12. ATOMIC RADIATION AND LIFE (From chapter I of ATOMIC RADIATION AND LIFE by Peter Alexander).

From the titles of the texts we can see that part of them are linked to Physics. However, the contents of the texts which are not directly linked to Physics can be said to belong to the area of Technology in which Physics is included.<sup>4</sup>

Indeed, texts are selected according to the major areas, Health and Technology, and this procedure accounts for the diversity of content in the texts applied to students of several courses in one area.

Despite the Physics Group's open preference for texts specific to Physics, and their presupposed knowledge of the subject, wbt and irg errors were detected in the translations of texts as numbers 7, 8, 9, 10 and 12, if we were to take those texts as the most specific to Physics.<sup>5</sup>

### 5.3. Specification of errors

#### 5.3.1. wbt type of error

As we have mentioned on page 65 of this chapter, we have classified as 'word-bound translation' error that which reflects the influence of the English structural elements on the rendered translation of English ngps into Portuguese. By 'word-bound translation' error we have referred mainly to this influence of the sequence of the exponents of English ngps with or without resulting new ngps in Portuguese; some of the wbt errors have produced an incorrect class-shift<sup>6</sup> by maintaining the same sequence of the exponents without accomplishing the necessary shift of the structural elements in the equivalent Portuguese ngp. For instance, in the translation of the ngp PHYSICAL ENVIRONMENT, in T6P, into 'física ambiental' and 'físico ambiental' the translation equivalent of the English adjective PHYSICAL, operating at e in the delicacy scale of (m)<sup>7</sup> has been translated by 'físico' and 'física' operating at h in the rendered Portuguese ngps 'física ambiental' and 'físico ambiental'; the same procedure

h                      (q)
h                      (q)

was found in:

1. NORMAL EVENT translated as 'normal eventual' (T6P)  
(m)                      h                      h                      (q)
2. ELECTRIC CHARGE translated as 'eletricidade carregada' (T7P)  
(m)                      h                      h                      (q)



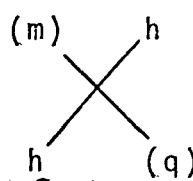


and 'recorrendo', which have been translated at morpheme-bound rank, reflect students' limited knowledge of -ing form as the only exponent of v in a verbal group. They do not know that "non-finite verbs are found in several structural places" <sup>11</sup> outside verbal group. They do not recognize an -ing form either operating at (m), or at h, as the translation of NORMAL BLADDER EMPTYING in T5N, into 'bexiga normal despejando/ esgotando' shows. <sup>12</sup>

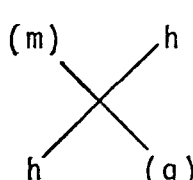
Besides giving rise to strange and sometimes deviant forms in Portuguese in face of the translation of the whole sentence where these ngps are inserted, errors like those in numbers 5 and 6 are evidence of the existing tendency to translate at work-rank. Morpheme-bound translations may be said to form one extreme of a scale if we were to produce a scaling classification of errors which concern this research. It is important to say that numbers 5 and 6 were counted up as wbt errors because 'ascendendo' and 'recorrendo' were not linked to any other group either preceding or following them; <sup>13</sup> when one of the structural elements in a ngp which expounds an -ing form, or -ed form, is translated as one of the structural elements of another group which precedes or follows that ngp, the resultant translation is not included in the wbt error type, as we shall explain the types of errors made in the translation of EXPOSED METALS, in the description of errors ignored in this research.

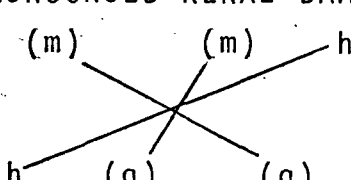
In the translation of the English ngps below, only an inversion in the sequence of their structural elements to get to their equivalents in Portuguese was necessary; that is to say, a shift from (m) h (modifier plus headword) to h (q)

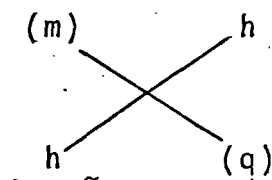
(headword plus qualifier). Thus, NORMAL EVENT in T6P should have been translated as

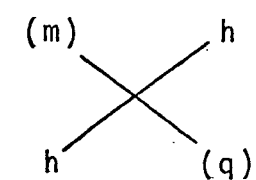
NORMAL EVENT  
  
 ocorrência normal

just like:

TISSUE INJURY  
  
 lesão tecidual

PRONOUNCED RENAL DAMAGE  
  
 lesão renal acentuada

ASCENDING INFECTION  
  
 infecção ascendente

RECURRING ATTACKS  
  
 ataques recorrentes

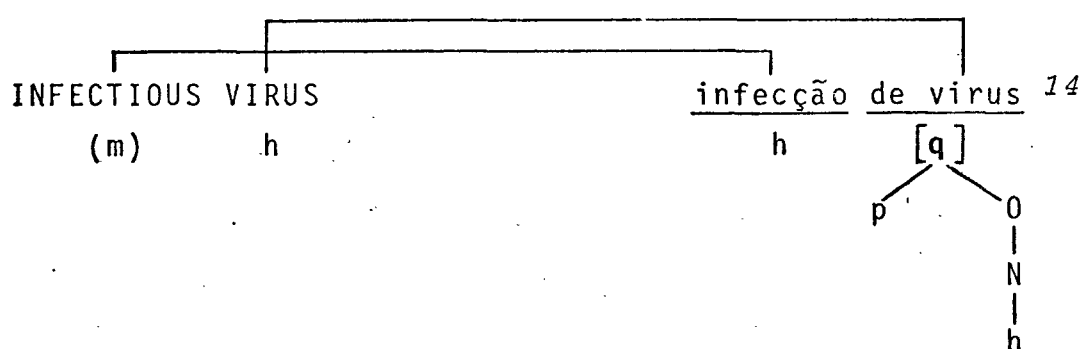
The translation of some ngps, as THIS LATTER PART (T10P) does not require a class-shift; LATTER also operates at (m) in its Portuguese equivalent 'segunda' or 'última'.

THIS	LATTER	PART
(m)	(m)	h
'esta segunda parte'		
(m)	(m)	h

However, its rendered translation into 'esta mais tardia parte' has interfered with the meaning conveyed by the English exponents of that ngp, due to formal similarity between two lexical items in English: LATTER and LATER.

### 5.3.2. irg type of error

This type of error refers to the influence of English structural elements of a ngp on its equivalent ngp in Portuguese, together with an inadequate insertion of a rankshifted group. For instance, in the translation of INFECTIOUS VIRUS, in T2N, into

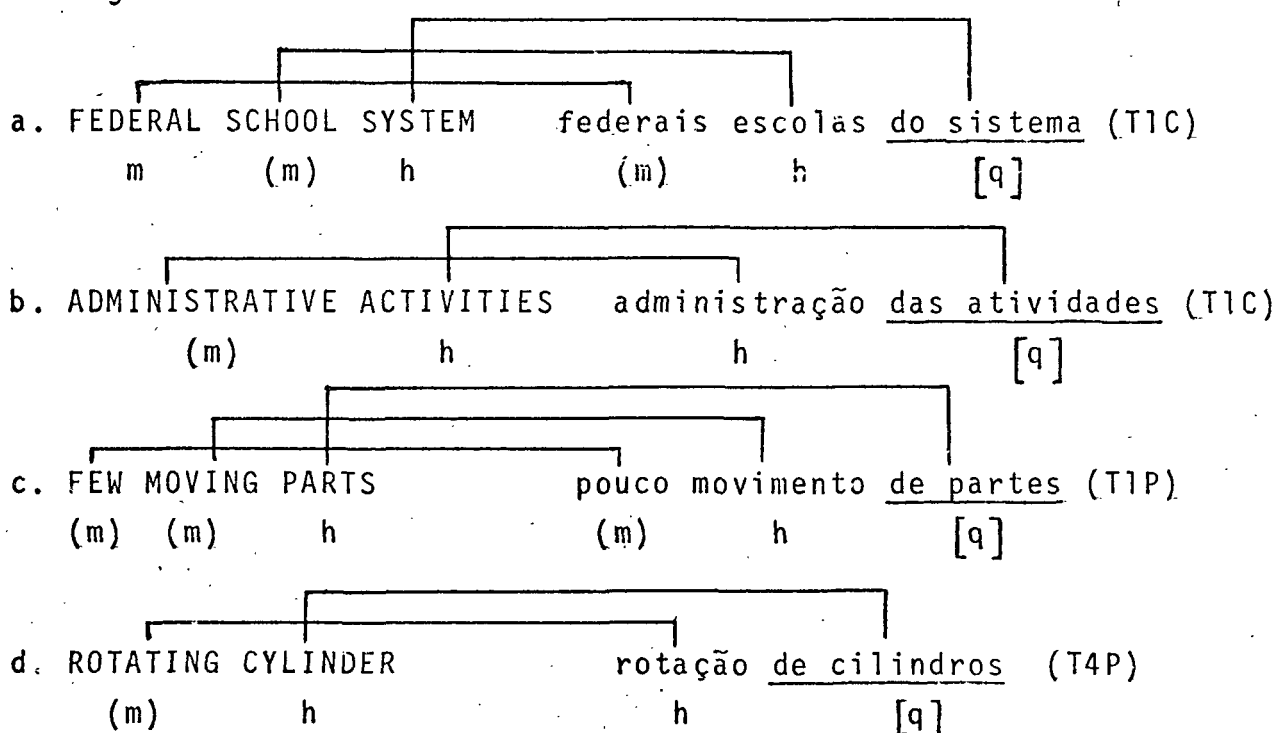


we have 'infecção' operating at h and 'virus' operating at [q] as the object of a preposition, 'de';<sup>15</sup> 'de vírus' is a rankshifted prepositional group operating at [q]. In 'de vírus' we have a preposition and its object - vírus - which is expounded by a noun (N) operating at h in the ngp 'virus'.

It is important to emphasize that, like in wbt errors, the influence of the English exponents was felt in the rendered translation; moreover, that insertion of a rankshifted group may

be seen as a transitory stage between word-bound translation and the necessary insertion of a rankshifted group in the translation of a ngp into Portuguese. However, since students are not sure as to how to deal with the structural elements of an English ngp, inadequate insertions of a rankshifted group have taken place where an insertion is actually necessary as well as where it is not necessary. The translations of the ngps below show two types of insertions: that which is inadequate but necessary in its Portuguese equivalent, and that which is inadequate as well as unnecessary. We might say that errors of this kind would form the other end of the scale which was mentioned on page 74 of this chapter. Students who have made irg errors seem to be somewhat aware of the necessity of the insertion of rankshifted groups in dealing with the translation of those English ngps which require that insertion in some equivalent Portuguese ngps.

i) Inadequate and unnecessary insertion of a rankshifted group at h in English ngps, and at q in its equivalent ngp in Portuguese:



ii) Inadequate insertion of a rankshifted group where an adequate one was necessary:

e. NORMAL BLADDER EMPTYING      normalidade da bexiga vazia (T5N)  
      m                    (m)                    h                    h                    [q]

f. TEACHING LAW                    ensino de leis (T1C)  
      (m)                    h                    h                    [q]

g. EFFICIENT HEAT LOSS                    eficiência do calor perdido (T2C)  
      (m)                    (m)                    h                    h                    [q]

h. STEEL WIRES                    aço de arame (T4P)  
      (m)                    h                    h                    [q]

i. RAPIDLY-MOVING PARTICLE      (um)rápido movimento de partícula (T9P)  
      (m)                    (m)                    h                    (m)                    h                    [q]

In a. b. c. and d. only the shift from (m)h to h(q) was necessary, except for the first m expounded by FEW, in FEW MOVING PARTS, which occupies the same position, at m in its equivalent Portuguese ngp; a. b. c. and d. could have been translated as:

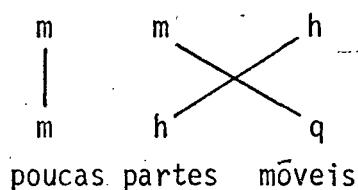
a. FEDERAL SCHOOL SYSTEM

     m                    m                    h  
      h                    q                    q  
      sistema escolar federal

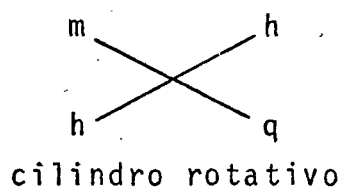
b. ADMINISTRATIVE ACTIVITIES

     m                    h  
      h                    q  
      atividades administrativas

## c. FEW MOVING PARTS

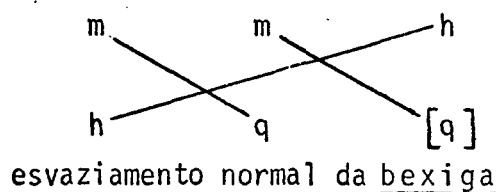


## d. ROTATING CYLINDER

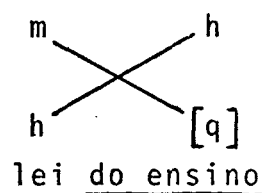


The translation of e. f. g. h. and i. requires the insertion of a rankshifted group; these might be translated as:

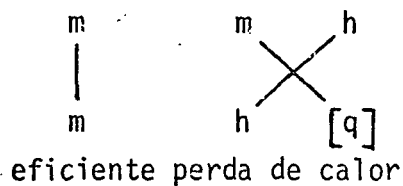
## e. NORMAL BLADDER EMPTYING



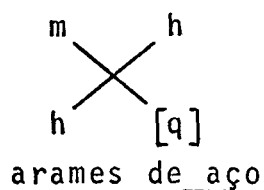
## f. TEACHING LAW



## g. EFFICIENT HEAT LOSS



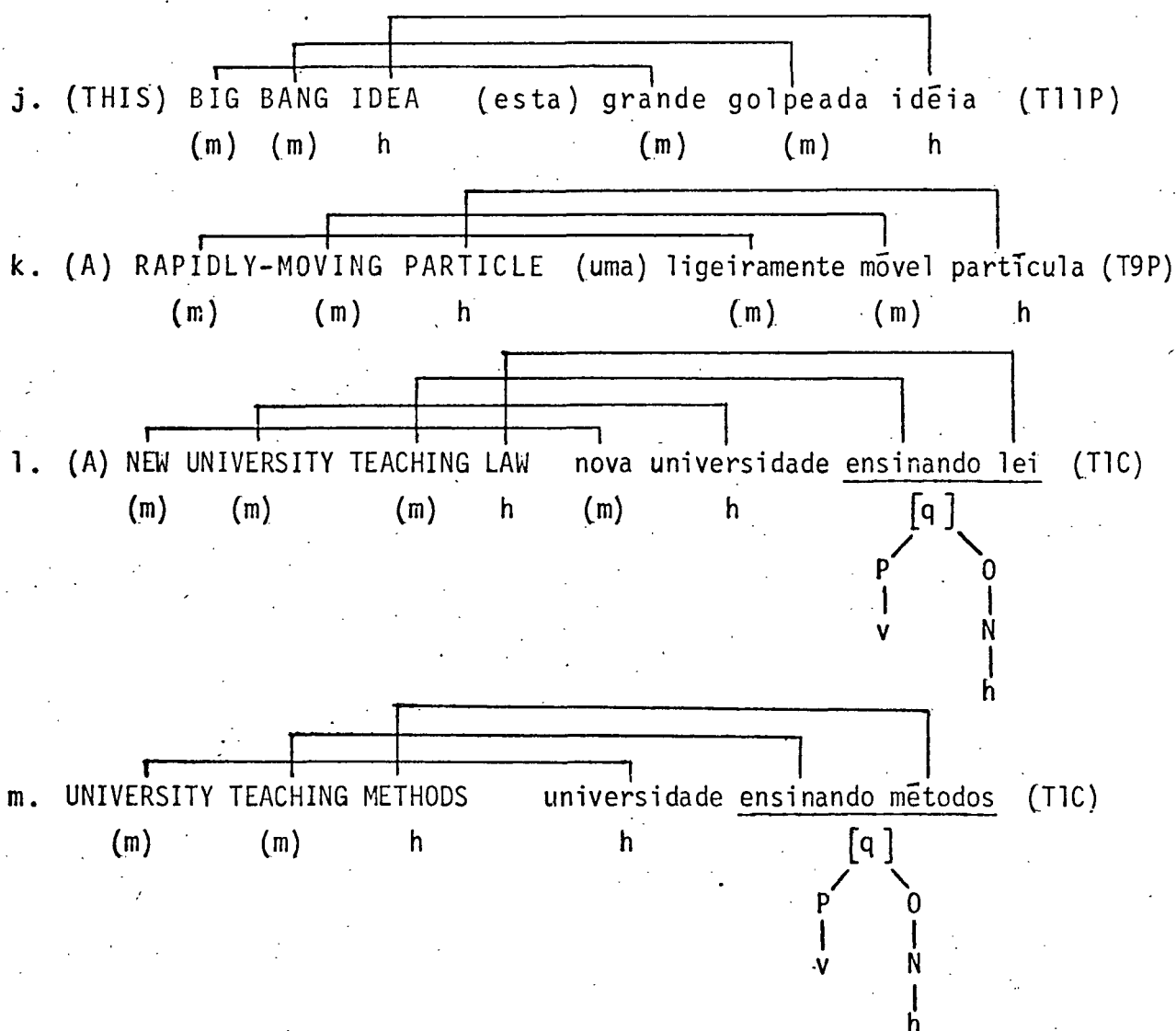
## h. STEEL WIRES



The translation of i. would require either a rankshifted group or a rankshifted clause at q, as we shall illustrate below, on

page 81, where another type of translation of the ngp (A) RAPIDLY-MOVING PARTICLE has been shown, in k.

In the errors classified as wbt ones, we have also found English ngps whose translation into Portuguese requires the insertion of a rankshifted group, besides the necessary class-shift from (m) h to h (q).

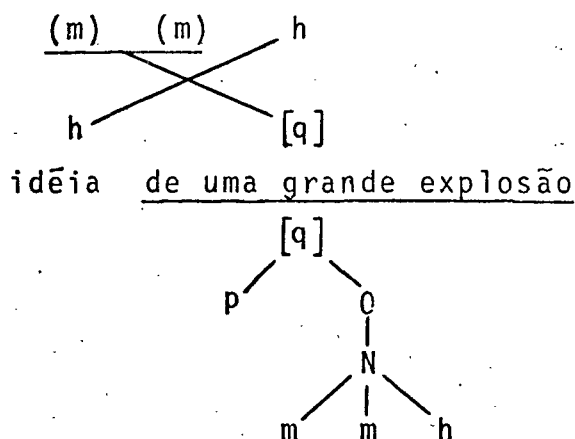


If we try to translate j. we see that there is the need for an inclusion of a rankshifted group at q in the equivalent Portuguese structure h (q); in the rendered translations above, in j. and k., respectively, a student was able to recognize h in both English ngps, but the sequence in which he has presented the

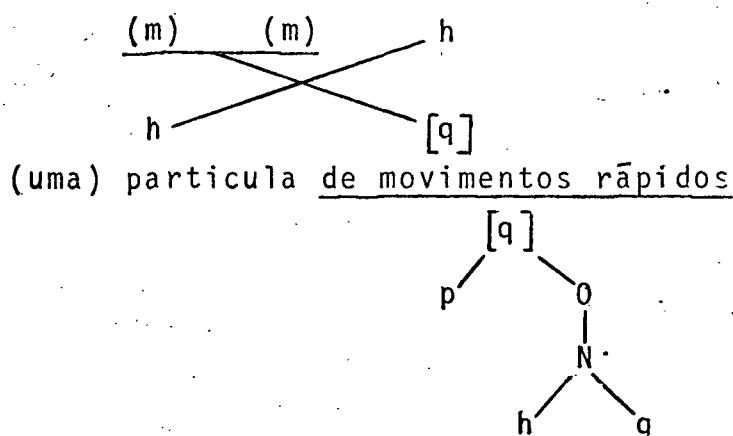


structural elements in his Portuguese translation and the misuse of the word 'golpeada', which cannot collocate with 'idēia', have interfered with the meaning of that ngp. In k. thirteen students managed to recognize PARTICLE as the headword of that ngp, however, the way they have presented the structural elements in their Portuguese translations, and the wrong translation of RAPIDLY into 'ligeiramente'<sup>18</sup> before the adjective 'mōvel', giving rise to a different meaning, have put the rendered translations as a wbt type of error. The translation of k. requires either a rankshifted group or clause at q. The translations of j. and k. might have been as follows:

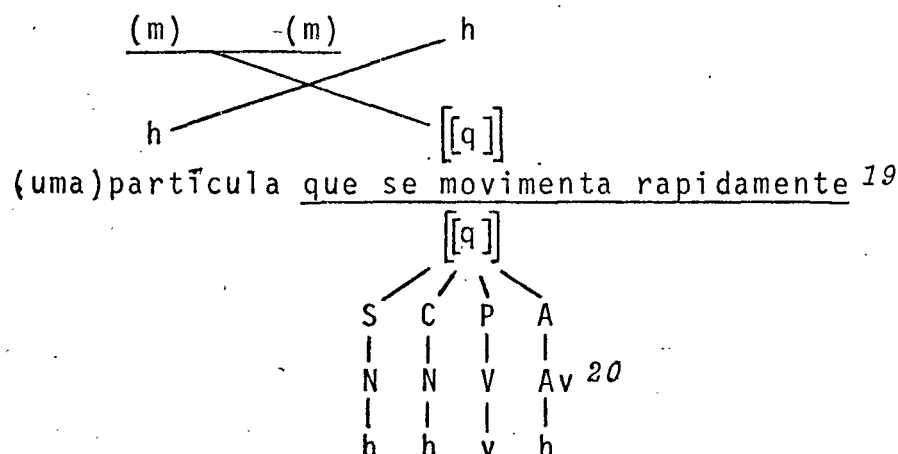
j. (THIS) BIG BANG IDEA



k. i) (A) RAPIDLY-MOVING PARTICLE



## ii) (A) RAPIDLY-MOVING PARTICLE

5.3.3. Errors which have been ignored

The total number of errors in ngps amounted to 1,021 of several types. Only 302 were included as the ones described as wbt and irg kinds, for they are the ones which basically reflect the influence of the sequence of the English structural elements on the rendition of other ngps in Portuguese. Thus, when we refer to a wbt error we refer to the way students have rendered equivalent Portuguese ngps in which we can detect problems involving marked evidence of that influence, either in the way students have perceived (m) or h in their translations. We are interested in analysing those translations where we can detect exponents of the noun and adjective classes involved; except for the morpheme-bound translation examples of adjectives ending in -ing, as in examples numbers 5 and 6, on page 73 we have ignored other types of errors as the following:

## (ONE OF) THE MOST HELPFUL MODERN INVENTIONS (in T1P)

- a. uma ajuda da invenção moderna
- b. uma das mais modernas...
- c. uma das invenções modernas mais útil
- d. uma das invenções moderna

- e. uma das mais útil e moderna invenções
- f. uma das mais úteis e moderna invenção
- g. uma das mais útil invenção moderna
- h. uma das mais úteis invenções moderna
- i. uma das mais útil invenções moderna
- j. uma das mais valiosa invenções moderna
- k. a maior ajuda das invenções modernas.

Translations a.c.g.h.i.j. and k. do not show a marked influence of the (m) h sequence; b. and d. have not produced a complete translation and as such, they have to be ignored. e. and f. are deviant Portuguese forms, since concord between modifiers and head-word has not been marked, either in modifiers or in the headword; in e., 'útil' and 'moderna' do not have the plural mark as the plural Portuguese headword 'invenções' requires; in f., the Portuguese headword 'invenção' and the modifier 'moderna' do not concord with the modifier 'úteis'. As the English headword INVENTIONS is in the plural, the Portuguese equivalent headword should have been translated as plural 'invenções' as well as the modifiers, which must concord in number with their headword. However, despite these deviations, students succeeded in avoiding a marked word-bound translation when they included a linking element, 'e', between the modifiers; the translation of this English nominal group does not forcibly require a class-shift. There is a certain mobility as to the position of the adjectives in Portuguese which might precede or follow the headword 'invenções'. Thus, the English ngp (ONE OF) THE MOST HELPFUL MODERN INVENTIONS might be translated as:

- (uma das) mais úteis e modernas invenções
- (m)                      (m)                      h

- (uma das) invenções modernas mais úteis  
                   h                   (q)                   (q)
- (uma das) mais úteis invenções modernas  
                   (m)                   h                   (q)

e. and f. cannot be said to satisfy all the requisites to be considered as a wbt error, as the following translation rendered by one student:

'(uma das) mais útil moderna invenções'

where the addition of that 'e' between the modifiers 'útil' and 'moderna' could have avoided a quite inadequate though deviant Portuguese ngp.

One of the English exponents of a ngp operating as a structural element of a verbal group in a rendered Portuguese translation is considered as a type of error which does not fit in with our description of wbt and irg error types, since we have limited this research to the problems involved in ngps, only; if a Portuguese verbal group has been formed out of one of the exponents of an English ngp, this error cannot be classified either as a wbt or an irg error. Consequently, the following translations have been ignored:

(THE PROCESS THAT ATTACK) EXPOSED METALS (in T2P):

- (de ataques que) a. 'explodem metais'
- (deste ataque) b. 'exposto aos metais'
- (que ataca) c. 'expondo os metais'
- (deste ataque) d. 'mostrado nos metais'
- (deste ataque para) e. 'expor metais'

The equivalents of EXPOSED in a. c. and e. are exponents of verbal groups; in b. and d. the modifier EXPOSED has been translated as a qualifier - 'exposto' and 'mostrado' - of the headword 'ataque'

which has, in turn, been translated as a noun instead of a verb. ATTACK operates at v in the verbal group which precedes EXPOSED METALS.

The same criterium was applied to the translation of SOLID EVIDENCE (T2N) into:

- '(o) sólido demonstra'

To this point, one English ngp has given rise to two different Portuguese groups: 'sólido' - one nominal group - and  
h

one verbal group, 'demonstra', with complete interference with  
v

comprehension. However, errors which have displayed verbal groups which are related to other elements in the same ngp, as the errors made in the translation of TEACHING in (A) NEW UNIVERSITY TEACHING LAW and in UNIVERSITY TEACHING METHODS into 'nova universidade ensinando lei' and 'universidade ensinando métodos' respectively, are to be taken into account in this research, because the limits of each English ngp can be clearly detected, that is to say, we are able to identify the English ngp as a unit in its Portuguese rendered translation. If all the structural elements of a ngp had become exponents of verbal or adverbial groups,<sup>21</sup> in the translations rendered, that ngp would not give us any hint as to the way some students perceive the structural elements (m) h in English ngps.

The errors made in the translation of ASCENDING in ASCENDING INFECTION and RECURRING in RECURRING ATTACKS, already mentioned in the classification of errors, have expounded verbal groups in their rendered Portuguese translations - 'ascendendo' and 'recorrendo', respectively - but as they have not been

linked to any other structural elements of the surrounding groups, they can be included in the types of errors which have served our purposes.

Thus, wbt errors may be characterized by the type of translation closely related to morpheme-bound as to the influence of the sequence of English ngps on the rendition of equivalent Portuguese ngps. Among wbt errors we may find ngps whose translation requires an insertion of a rankshifted group or clause at (q) as the equivalent Portuguese structural element to one (m) in an English ngp.

Errors labelled as irg have also occurred in ngps whose translation does not necessarily need the insertion of a rankshifted group or clause at (q) as one of the equivalent Portuguese structural elements, occupying the position of (m) in an English ngp.

#### 5.4. The types of ngps which have been disregarded

Before presenting the statistical analysis applied to the types of errors mentioned above, a brief explanation about the kinds of ngps which have not been taken into account as part of this research is necessary.

To find out the error rate per student in each ngp<sup>22</sup> - which we shall be discussing in the following pages - we had to take into account the number of errors - wbt and irg ones - and the number of ngps in each text administered to our EL I students. The number of words forming a ngp has also been taken into consideration as a possible factor which has posed some difficulties in the translation of ngps. In this way, the

counting up of ngps contained in each text was necessary to estimate the error rate per student, in each ngp, and to verify a possible relation of dependence between the number and types of errors and the number of words forming a ngp.

We have decided not to count up those ngps formed by deictics such as A, AN, THE, THIS, THAT, THESE and THOSE and possessive pronouns operating at (m) immediately preceding a noun at h, as in THIS WAY (T12P) and OUR OAR (T9P); ngps of these types have not been counted up as two-word ngps since they have not constituted any difficulty in their translation into Portuguese. The deictics A, AN, THE, THIS, THAT, THESE and THOSE have not been counted up even in ngps of three or more words.<sup>23</sup> However, possessive pronouns have been counted up in ngps which present a submodifier, as in OUR OWN GALAXY (T11P). Deictics have also been counted up if they have been preceded by ALL, as in ALL THESE MACHINES (T1P) and ALL THE METHODS (T8P); rankshifted possessive nominal groups, as PLANCK'S in PLANCK'S CONSTANT (T8P) have been counted up as exponents of modifiers.

Any element operating at (q) has been left out of the counting up of the words which form a ngp. If a nominal group happens to be operating at (q) it has been counted up as an independent ngp,<sup>24</sup> for we have treated ngps independent of their function, either in ngp structure or in clause structure, as we have already mentioned in chapter 1.

#### 5.5. Omissions in the translations of ngps

Within the total number of all types of errors made in the translations of the twenty-eight texts administered to the Physics and the Nursing Groups - 1,021 errors altogether - we

have also taken into consideration the number of translations of ngps which have been omitted. In the list of all the types of errors made in ngps such blanks have been labelled INCOMPLETE.

The Nursing Group has left out the translation of eleven ngps in the specific texts, what gives us a percentage of 3,20% of the 344 ngps found in those fourteen specific texts translated by that group. The two types of errors, namely wbt and irg, have occurred in 7 ngps out of those eleven ones where omission has taken place. Thus, in 63,64% of the ngps which were left untranslated, wbt and irg types of errors have also been found; this confirms the fact that those ngps actually have posed some difficulties to our students.

The ngps which have caused wbt and irg errors as well as omission are the following: THE THIN, FLEXIBLE DRUM (T1N) THE LYMPH NODE STATIONS (T3N) THE LEFT COLIC ARTERIES (T3N) ROOM AIR (T4N) LOWERED RESISTANCE (T5N) THE INTERNAL CERVICAL OS (T10N) and INCREASING PARITY (T10N).

The ngps which have caused other types of errors as well as omission are the following four ngps: LOWER AIRWAYS (T4N) LIVER CELLS (T7N) LUTEAL PHASE (T9N) and SEPTATE OR BICORNUATE UNICOLLIS UTERI (T9N). This last ngp has not been translated by twenty-one students, probably due to the marked use of Latin roots and affixes which characterize a number of words on technical texts.

The Physics Group has not rendered the translation of three ngps from the specific texts; thus, the percentage is 1,35% obtained from the number of ngps where omission was produced and the total number of ngps- 222 - in all those specific texts.



The ngps which have caused wbt and irg errors plus omission are the following: THE ONLY OBJECT (T7P) and 'BUILT IN' STRESS (T3P); in the ngp UNIQUE PROPERTIES (T3P) other types of errors plus omission have been produced. Thus, in 66,67% of those three ngps wbt and irg errors have occurred together with omission; in 33,33% only omission and other types of errors have been produced.

In the specific texts we have seen that the percentage of omission and other types of errors as well as omission plus wbt and irg types of errors has been almost equal. The table below shows the percentage of omission plus wbt and irg types of errors in the same ngps, in the specific texts translated by both groups of students, and also omission plus other types of errors in the same ngps, in the texts mentioned.

Table 1

Omission and wbt/irg types of errors in specific texts; omission and other types of errors in the same texts.

Nursing and Physics Groups

Groups	Omission and <u>wbt/irg</u> errors	Omission plus other types of errors
Nursing Group	63,64%	36,36%
Physics Group	66,67%	33,33%

In the non-specific texts, only in the first text studied, EDUCATION IN BRAZIL (T1C) omission and wbt and irg errors have been produced. The ngp which has caused omission and wbt and irg errors was THE COUNTRY'S UNIVERSITIES (T1C) in which another type of error was also made. Thus, in the same ngp, wbt errors, irg ones, omission as well as another type of error

have been found.

No omission occurred in the second non-specific text - RACE AND HEREDITY. Both groups of students have translated those two non-specific texts as if they were only one group of students; those texts have been administered with the purpose of detecting possible areas of difficulties common to both groups of students, in confrontation with the difficulties encountered by each group of students when translating the specific texts. The highest percentage of omission which has co-occurred with wbt and irg errors, in the same ngp, might lead us to conclude that a possible cause of those errors and omissions was due to the markedly specific aspect of the English ngps in which those errors and omissions occurred. However, from the list of errors in ngps, with the percentage of students who have made those wbt and irg types of errors, provided in appendix 2.2.4., we can see that the English ngps in which the highest percentage of students made wbt and irg errors, do not belong to a highly specific vocabulary, as the high percentages produced by the translation of THE NEXT INSTANT (T10P) and THE THIRD TRIMESTER (T10N), respectively 54,17% and 36,84%, show. Admitting that the explanation of errors is certainly a most vulnerable area of error analysis, we also recognize that omission in translated texts is a difficult area whose causes cannot be easily tackled. Although omissions do not lend themselves to an accurate evaluation of how students have perceived the sequence of structural elements in a ngp, they have been taken into account because students have succeeded in perceiving the limits of those ngps by omitting exactly the translation of the exponents of the structural elements which have formed those ngps, namely

the exponents of (m) and h.

#### 5.6. Statistical analysis of wbt and irg errors

To analyse the role which the sequence of the structural elements of English ngps has played in the translation of texts applied to the Physics and the Nursing Groups, it has been necessary to take into consideration the number of wbt and irg errors in relation to the other types which also occurred in the translation of ngps.

At the end of the first semester of 1979, twenty-four students of Physics had translated 12 specific texts; thirty-eight Nursing students had translated 14 specific ones, in the same period. At the beginning of the semester both groups of students translated the same non-specific texts, which we have been referring to as TC. Thus, the specific texts applied to both groups of students were different but the two non-specific ones were the same, namely, EDUCATION IN BRAZIL (T1C) and RACE AND HEREDITY (T2C).

To verify whether the number of wbt and irg errors were statistically significant in relation to the other types of errors which also occurred in ngps, the test of proportion<sup>25</sup> was applied to the two types of texts - specific and non-specific ones; although the Physics students and the Nursing ones have translated the same two non-specific texts, we have decided to apply the test of proportion to the results obtained from each group of students separately, since we have been interested in verifying the significance of wbt and irg errors in the specific texts as well as in the non-specific ones in each group of students.

Table 2

Total of errors in ngps, wbt/irg errors in ngps and other types of errors in ngps, in non-specific and specific texts translated by the Physics and Nursing Groups 1st semester, 1979

Federal University of Paraíba

Number of Physics students: 24

Number of Nursing students: 38

Texts	NON - SPECIFIC TEXTS										SPECIFIC TEXTS										T O T A L		
	PHYSICS GROUP					NURSING GROUP					PHYSICS GROUP					NURSING GROUPS							
	Total errors	wbt/irg errors	other errors	$\chi^2$	d.f.	Total errors	wbt/irg errors	other errors	$\chi^2$	d.f.	Total errors	wbt/irg errors	other errors	$\chi^2$	d.f.	Total errors	wbt/irg errors	other errors	$\chi^2$	d.f.	Total errors	wbt/irg errors	other errors
01	46	16	30	0,099	1	38	19	19	6,662	1	44	18	26	0,910	1	40	11	29	0,456	1			
02	37	17	20	3,083	1	34	11	23	0,00	1	18	06	12	0,000	1	39	15	24	0,461	1			
03											31	09	22	0,200	1	67	14	53	4,331	1			
04											52	28	24	10,574	1	52	08	44	7,079	1			
05											47	12	35	1,516	1	63	16	47	1,786	1			
06											09	06	03	6,000	1	42	10	32	1,714	1			
07											29	11	18	0,200	1	32	01	31	13,853	1			
08											59	17	42	0,681	1	41	12	29	0,434	1			
09											16	07	09	1,164	1	59	13	46	17,361	1			
10											06	03	03	0,750	1	45	06	39	8,100	1			
11											11	05	06	0,393	1	06	-	06	3,000	1			
12											08	04	04	0,533	1	23	06	17	0,767	1			
13															-	14	-	14	7,778	1			
14															-	13	1	12	3,250	1			
Total	83	33	50			72	30	42			330	126	204			536	113	423			1021	302	719
Total $\chi^2$	$\chi^2_{1g.1.}; 0,05=3,840$			1,347	1	$\chi^2_{1g.1.}; 0,05=3,840$			2,250	1	$\chi^2_{1g.1.}; 0,05=3,840$			3,491	1	$\chi^2_{1g.1.}; 0,05=3,840$			36,537	1			

Table 2 shows the number of non-specific texts and the specific ones, the total number of errors (the wbt/irg ones plus the other types of errors in ngps) the number of wbt and irg errors, the number of other types of errors, separately, and the chi-square test<sup>26</sup> applied to the total number of errors, the total number of wbt/irg errors and the total of other types of errors in each text.

The test of proportion was applied to the results obtained from the total of wbt and irg errors in confrontation with the total number of all errors in ngps, in each type of text and in each group of students.<sup>27</sup> The hypothesis which says that the proportion of wbt and irg errors is equal to or higher than the ratio of the total number of all errors to the total number wbt and irg errors, in all the texts, has been accepted in the non-specific texts translated by the Physics and the Nursing students;<sup>28</sup> however, in the specific texts, the hypothesis mentioned above has been accepted only in the results obtained from the Physics students.<sup>29</sup> As to the Nursing Group's results the number of wbt and irg errors was not significant, for their proportion was not equal to or higher than the proportion established by the test, that is, in three errors one is of the wbt, or irg type.<sup>30</sup>

This result shows that the sequence of structural elements of ngps has not constituted a statistically significant difficulty for those Nursing students, in the specific texts; we assume that some familiarity with the subjects discussed in the texts may have facilitated their interpretation of ngps. However, in the non-specific texts, the number of wbt and irg errors made by the same group of students was statistically significant;

probably their knowledge of the subjects in those two non-specific texts was limited and the linguistic difficulties posed by ngps were not overcome to the point of equalling the results in both types of texts.

The obstacles posed by ngps in the specific and non-specific texts have not been overcome by the Physics students. The statistically significant number of wbt and irg errors makes us believe that those students' knowledge of the subjects was not sufficient for them to cope with the difficulties in ngps.

Table 3 shows the number of wbt and irg errors made by each group of students, the number of ngps and the error rate per student, in each ngp, in the non-specific texts.

Although both groups of students have translated the same two non-specific texts, it is necessary to present the estimation of the error rate per student, in each ngp, in each group of students, separately, since we want to verify whether there is any discrepancy between the average of error rates per student, in each ngp, in the non-specific texts, and the average of error rates per student, in each ngp, in the specific texts, in each group of student.

From the table below we see that the twenty-four Physics students made 33 wbt and irg errors, in the two non-specific texts, which presented a total of 91 ngps, and the average of error rate per student, in each ngp, was 1,52%. The total of 30 wbt and irg errors in the same non-specific texts was produced by the thirty-eight Nursing students, and the average of error rate per student, in each ngp, was 0,91%.

Table 3

Error rate per student, in each ngp  
 Non-specific texts translated by the Physics and  
 the Nursing Groups  
 1st semester, 1979  
 Federal University of Paraíba  
 Number of Physics students: 24  
 Number of Nursing students: 38

T e x t s	Physics Group			Nursing Group		
	e <u>1</u>	n <u>2</u>	% <u>3</u>	e <u>1</u>	n <u>2</u>	% <u>3</u>
T1C	16	40	1,66	19	40	1,25
T2C	17	51	1,39	11	51	0,57
T o t a l	33	91	1,52	30	91	0,91

Source: Direct research

1 : number of wbt and irg errors

2 : number of ngps in the text

3 : error rate per student, in each ngp, in  
that text

In Table 4 we have the number of specific texts administered to the Physics and the Nursing Groups, the number of wbt and irg errors, the number of ngps in each text and the error rate per student, in each ngp. Both groups of students translated different specific texts; the Physics Group translated 12 specific texts and the Nursing Group translated 14 specific ones.

Table 4

Error rate per student, in each ngp, in the specific texts.  
 Texts translated by the Physics and the Nursing Groups  
 1st semester, 1979

Federal University of Paraíba

Number of Physics students: 24

Number of Nursing students: 38

Texts	Physics Group			Nursing Group		
	e <u>1</u>	n <u>2</u>	% <u>3</u>	e <u>1</u>	n <u>2</u>	% <u>3</u>
1	18	25	3,00	11	42	0,69
2	5	17	1,47	15	42	0,94
3	9	13	2,88	14	30	1,23
4	28	25	4,67	8	37	0,57
5	12	9	5,55	16	18	2,34
6	6	11	2,27	10	11	2,39
7	11	33	1,39	1	25	0,10
8	17	31	2,28	12	28	1,13
9	7	16	1,82	13	20	1,71
10	3	10	1,25	6	19	0,83
11	5	14	1,49	-	21	-
12	4	18	0,92	6	13	1,21
13				-	23	-
14				11	15	0,17
Total	126	222	2,42	113	344	0,95

Source: Direct research

1 : number of wbt and irg errors.

2 : number of ngps in the text

3 : error rate per student, in each ngp, in each text



Table 4 shows that the twenty-four Physics students made 126 wbt and irg errors, in the translation of twelve specific texts in which 222 ngps were found; the average of error rate per student, in each ngp, of this group was 2,42%; the Nursing Group translated fourteen specific texts, with a total of 344 ngps, and made 113 wbt and irg errors; the average of error rate per student, in each ngp, was 0,95%.

The average of error rates per student, in each ngp, of the Physics Group was 1,52%, in the non-specific texts, and 2,42%, in the specific ones. The Nursing Group presented an average of error rates per student, in each ngp, of 0,91%, in the non-specific texts, and 0,95%, in the specific ones.

To verify whether there was any significant discrepancy between the average of error rates per student, in each ngp, in the specific texts and the average of error rates per student, in each ngp, in the non-specific ones, in each group of students, the 't' test of Student <sup>31</sup>, to detect differences in the averages, was applied. We have assumed that the interpretation of ngps in the specific texts was easier for each group of students, since those texts are related to students' academic fields. The first sample ( $n_1$ ) was formed by the non-specific texts from which the average ( $\bar{x}_1$ ) of error rates per student, in each ngp, as well as the standard deviation ( $s_1$ ) were estimated. The second sample was formed by the specific texts ( $n_2$ ) from which the average ( $\bar{x}_2$ ) of error rates per student, in each ngp, and the standard deviation ( $s_2$ ) of the error rates were estimated <sup>32</sup>.

The test mentioned above was applied to the Physics

Group, and the results showed that there was no difference between the average of error rates per student, in each ngp, in the specific texts and the average of error rates per student, in each ngp, in the non-specific ones <sup>33</sup>.

The same test <sup>34</sup> was applied to the error rates per student, in each ngp, in the specific texts and in the non-specific ones administered to the Nursing Group <sup>35</sup>. The results of the test showed that there was no difference between the average of error rates per student, in each ngp, in the specific texts, and the average of error rates per student, in each ngp, in the non-specific texts.

The results of the application of this statistical test revealed that the knowledge of the subject was not a decisive factor in those students' individual performance, either in the specific texts or in the non-specific ones. As to the Physics and the Nursing students' individual performance, we can conclude that ngps, in both types of texts, constituted an area of difficulty, irrespective of the type of texts where they were inserted.

To verify whether there was any correlation between the number of words compounding a ngp and the error rate per student, in each ngp, in the rendition of wbt and irg errors separately, it was necessary to estimate the error rates per student, in each ngp, in the non-sepcific texts and in the specific ones, first. Both groups of students have been considered as only one, in the non-specific texts, since we have been interested in assessing any correlation between the length of ngps and the rendition of wbt and irg errors, only.

Table 5

Wbt and irg errors, number of ngps in each text,  
error rate per student, in each ngp, and the length  
of the ngps in the non-specific texts.

Physics and Nursing students

Number of students: 62

TEXT	2wg						3wg						4wg						5wg						6wg					
	wbt			irg			wbt			irg			wbt			irg			wbt			irg			wbt			irg		
	e <sup>1</sup>	n <sup>2</sup>	% <sup>3</sup>	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%
1	13	22	0,95	8	22	0,59	7	13	0,87	5	13	0,62	1	5	0,32	1	5	0,32	-	-	-	-	-	-	-	-	-	-	-	-
2	9	31	0,47	5	31	0,26	9	17	0,85	5	17	0,47	-	2	-	-	2	-	-	1	-	-	1	-	-	-	-	-	-	-
TOTAL	22	53	0,67	13	53	0,39	16	30	0,86	10	30	0,54	1	7	0,23	1	7	0,23	-	1	-	-	1	-	-	-	-	-	-	-

Source : Direct research

<sup>1</sup> : number of errors made

<sup>2</sup> : number of ngp in each text

<sup>3</sup> : error rate per student in each ngp

In Table 5 we have the error rate per student, in each ngp, in wbt errors and in irg ones, separately, because we also wanted to verify whether students tended to produce one type of error rather than the other, as the number of structural elements increased.

The number of words forming the ngps precedes the letters wg; for instance, 2wg means that we are referring to a two-word ngp. The table above presents the results from the two non-specific texts.

In Table 5 we see that no error occurred in the only ngp formed by five words, and that no ngp with six words was found in those two texts. This means that the correlation test is to be applied to 2wg, 3wg and 4wg, only.

Table 6 presents the number of wbt and irg errors made by the Physics students, number of ngps in each text, and the error rate per student, in each ngp, in ngps of two, three and four words, in the specific texts.

Table 6 shows no occurrence of 5wg, and only one 6wg, where no wbt and irg errors were made. Thus, the correlation test is to be applied to ngps of two, three and four words, only.

Table 7 also presents the number of wbt and irg errors in ngps of two, three, four, five and six words, the number of ngps in each specific text translated by the Nursing Group, and the error rate per student, in each ngp.

Table 6

Wbt and irg errors, number of ngp in each text, error rate per student, in each ngp, and the length of ngps in the specific texts translated by the Physics Group.

Number of students: 24

TEXT	2wg						3wg						4wg						5wg						6wg					
	wbt			irg			wbt			irg			wbt			irg			wbt			irg			wbt			irg		
	e <sup>1</sup>	n <sup>2</sup>	% <sup>3</sup>	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%
1	5	19	1,1	10	19	2,19	-	5	-	2	5	1,66	1	1	4,17	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
2	2	13	0,64	3	13	0,96	-	4	-	1	4	1,04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	2	13	0,64	7	13	2,24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	13	21	2,58	13	21	2,58	1	4	1,04	1	4	1,04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	8	8	4,17	4	8	2,08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	
6	3	10	1,25	3	10	1,25	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
7	3	29	0,43	2	29	0,29	5	4	5,20	1	4	1,04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	5	18	1,16	1	18	0,23	5	10	2,08	1	10	0,42	1	3	1,39	4	3	5,55	-	-	-	-	-	-	-	-	-	-	-	
9	3	14	0,89	1	14	0,30	1	2	2,08	2	2	4,17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	2	8	1,04	1	8	0,52	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	-	9	-	1	9	0,46	1	5	0,83	3	5	2,5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	1	12	0,35	2	12	0,69	1	5	0,83	-	5	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL	47	174	1,12	48	174	1,15	14	41	1,42	11	41	1,12	2	6	1,38	4	6	2,78												

Source: Direct research

1 : number of errors

2 : number of ngp in each text

3 : error rate per student, in each ngp.

Table 7

Wbt and irg errors, number of ngps, in each text, error rate per student, in each ngp, and the length of ngps in the specific texts translated by the Nursing Group  
Number of students: 38

Text	2wg						3wg						4wg						5wg						6wg					
	wbt			irg			wbt			irg			wbt			irg			wbt			irg			wbt			irg		
	e 1	n 2	% 3	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%	e	n	%
1	1	32	0,082	5	32	0,41	1	8	0,33	2	8	0,65	-	-	-	-	-	-	-	-	-	-	-	1	-	2	1	5,26		
2	8	33	0,64	7	33	0,56	-	9	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	1	13	0,20	2	13	0,40	5	17	0,77	6	17	0,93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	3	28	0,28	2	28	0,40	-	7	-	1	7	0,37	1	2	1,31	1	2	1,31	-	-	-	-	-	-	-	-	-	-	-	
5	5	14	0,94	5	14	0,94	2	3	1,75	3	3	2,63	1	1	2,63	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
6	4	8	1,31	2	8	0,66	2	2	2,63	1	2	1,31	1	1	2,63	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
7	-	23	-	-	23	-	1	2	1,31	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	4	17	0,62	-	17	-	4	8	1,31	1	8	0,33	1	2	1,31	1	2	1,31	1	1	2,63	-	1	-	-	-	-	-	-	
9	6	10	1,58	-	10	-	1	6	0,44	4	6	1,75	1	4	0,65	1	4	0,66	-	-	-	-	-	-	-	-	-	-	-	
10	-	10	-	3	10	0,79	1	8	0,32	2	8	0,66	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
11	-	17	-	-	17	-	-	4	-	-	4	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	
12	-	9	-	-	9	-	4	4	2,63	2	4	1,31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	-	15	-	-	15	-	-	7	-	-	7	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
14	-	8	-	-	8	-	-	5	-	-	5	-	-	2	-	1	2	1,31	-	-	-	-	-	-	-	-	-	-	-	
Total	32	237	0,35	26	237	0,29	21	90	0,61	22	90	0,64	5	14	0,93	4	14	0,75	1	2	1,32	-	2	-	-	1	-	2	1	5,26

Source: Direct research

1/: number of errors

2/: number of ngps

3/: error rate per student, in each ngp.

In Table 7 we see that wbt and irg errors have been made in ngps of five and six words; thus, the correlation test is to be applied to ngps of two, three, four, five and six words, although the number of errors, either wbt or irg ones, has been very small in ngps of 5 and 6 words.

Table 8 shows the relation between the length of ngps and the wbt and irg error rates per student, in each ngp, separately in the non-specific texts, involving both groups of students.

Table 8

Length of ngps and the error rates per student, in each ngp, in wbt and irg errors, with the correlation rate of both types of errors.

Physics and Nursing Groups

Number of students: 62

Non-specific texts

length of ngps error rate per student, in each ngp (%)	2wg	3wg	4wg	Correlation rate
wbt	0,67	0,86	0,23	0,81 = 81%
irg	0,39	0,54	0,23	0,87 = 87%

The correlation test<sup>36</sup> was applied to the number of words compounding the ngps and the error rates per students, in each ngp, for each type of error in the non-specific texts. The correlation rate<sup>37</sup>, obtained in each type of error, has shown

that there is no tendency for one type of error to prevail over the other, as the number of words in ngps increases.

The same test was applied to the number of words forming the ngps and the error rates per students, in each ngp, and in each type of error, in those texts administered to the Physics Group. Table 9 shows the results obtained from the specific texts administrated to the Physics Group.

Table 9

Length of ngps and the error rates per student, in each ngp, in wbt and irg errors, with the correlation rates of both types of errors. Specific texts translated by the Physics Group. Number of students: 24

length of ngps error rate per student, in each ngp (%)	2wg	3wg	4wg	Correlation rate
wbt	1,12	1,42	1,38	0,98 = 98%
irg	1,15	1,12	2,78	0,97 = 97%

From the results obtained in the specific texts applied to the Physics Group we see that students have the tendency to make the same types of errors, either wbt or irg, irrespective of the number of words forming a ngp.

Table 10 presents the correlation rate in the wbt errors and in irg ones, in ngps of two, three, four, five and six words. No irg error was made in the ngp with five words;



no wbt error was found in the only six-word ngp which occurred in the texts administered to the Nursing Group.

Table 10

Length of ngps and the error rates per students, in each ngp, in wbt and irg errors, with the correlation rates of both types of errors.  
Specific texts translated by the Nursing Group  
Number of students: 38

length of ngps error rate per student, in each ngp (%)	2wg	3wg	4wg	5wg	6wg	Correlation rate
wbt	0,35	0,61	0,93	1,32	-	0,99 = 99%
irg	0,29	0,64	0,75	-	5,26	0,86 = 86%

From the results obtained, we see that there is a correlation between the length of the ngps and the error rates per student, in each ngp. Thus, the results presented in Tables 8, 9, and 10 show that in both types of texts, either in the specific or in the non-specific ones, the error rates per student, in each ngp, increase as the number of words forming a ngp also increases.

#### 5.6.1. Comments on the results from the statistical tests

The sequence of the structural elements of ngps has exerted an influence on the interpretation of ngps by those EL I students, despite the result produced by the application of the

test of proportion to the number of wbt and irg errors, made by the Nursing students, in the specific texts; that result did not represent an alarming discrepancy to the point of invalidating our assumption mentioned above. It shows that Nursing students' knowledge of the subjects discussed in the specific texts may have been a factor which facilitated the interpretation of ngps and, therefore, the rendition of a statistically significant number of wbt and irg errors was avoided. However, a different result was obtained in the interpretation of ngps, inserted in the non-specific texts, applied to the same group of students; the number of wbt and irg errors was statistically significant. This result makes us assume that their knowledge of the subjects, introduced in the non-specific texts, was not a decisive factor in avoiding the influence of the sequence of the structural elements on the students' interpretation of ngps. This same conclusion has been drawn from the results produced by the application of the test of proportion to the number of wbt and irg errors, made by the Physics students, in both types of texts. Their knowledge of the subjects discussed in those texts was presumably limited, since they were not able to avoid the influence of the sequence of the structural elements in English ngps on their equivalents in Portuguese.

If we compare the individual performance of the members of both groups of students, with the types of texts applied (specific and non-specific ones) we see that the average of error rates per student, in each ngp, was equal in both types of texts. That is to say, the factor 'knowledge of the subject' was not sufficient to avoid the production of wbt and irg errors by students, individually, irrespective of the fact that some texts

were linked to the academic fields of each group of students. Thus, by the individual performance of the Physics and the Nursing students, we are inclined to assume that the individual knowledge of the subjects presented in both types of texts was not sufficient for each student to avoid the influence of the sequence of the structural elements in English ngps on the translation of ngps. The inability to identify the structural elements of ngps was, therefore, an obstacle to the comprehension of ngps, in both types of texts.

There is some correlation between the error rates per student, in each ngp, and the number of words forming a ngp; the wbt and irg error rates per student, in each ngp, increased, as the number of words in the ngps also increased, in both types of texts and in both groups of students. Nevertheless, we cannot say that this is a cause-and-effect relationship. This correlation may also reinforce those aspects which we have been referring to: the poor knowledge of the subjects and the students' inability to identify the structural elements in English ngps.

The problems which ngps have caused to these EL I students, either in specific or in non-specific texts, may give rise to further studies. In our work we have been engaged in pointing out the interference of the sequence of the structural elements in English ngps, in the translation of equivalent ngps into Portuguese, with consequent interference with comprehension. We also admit that this work does not provide the elements necessary for a comprehensive evaluation of the problems which ngps have posed to our EL I students. Our main purpose has been to show that ngps comprise an area of difficulty and to suggest that some changes in the EL I programme should be made.

## NOTES

<sup>1</sup>'Letras' students were not included in this research because at the time this research was carried out their course had distinct purposes from those in EL I Course.

<sup>2</sup>Complete references of all the texts applied to the Nursing and Physics Groups could not be provided by the Department of Modern Foreign Languages.

<sup>3</sup>An EL I group of students is usually formed by students of different groups in other disciplines; one student, for instance, can have X and Y as classmates in his EL I Course but different classmates in his, say, Pathology Course. Students are offered a certain number of disciplines each semester; they usually take those which are pre-requisites to other disciplines or those which fit best their own conveniences. Thus, an EL I group of students may or may not be having all the disciplines offered at that semester. Moreover, at the Medical School the offer of some disciplines to Nursing students does not take place in the same semester as they are offered to Medical students. It seems to us that this administrative aspect should be helpful as to the selection of future texts to be studied either by Nursing Groups or by Medical students.

<sup>4</sup>The favourable aspect of the inclusion of texts which were not directly linked to the major area of those students in that group was that we were able to observe their reaction to the application of texts numbers 1, 2, 3 and 4; they claimed that they would prefer to deal with texts just like numbers 7, 8, 9, 10 and 12.

<sup>5</sup>In texts numbers 7, 8, 9, 10 and 12, twenty-seven wbt errors and fifteen irg errors were made. Except for text 4 in which they made the highest number of wbt and irg errors - twenty-eight altogether- it was in text 8 that they made the second highest number of wbt and irg errors: eleven wbt errors and six irg errors; seventeen errors of both types.

<sup>6</sup>CATFORD, p.78-9.

<sup>7</sup>d, o, e, and n are the structural elements of the delicacy scale at (m); see chapter 1 for details.

<sup>8</sup>The parallel lines linking the English ngps to Portuguese translations of those groups indicate which word in an English ngp has produced that one in the rendered Portuguese ngp.

<sup>9</sup>SINCLAIR, p.174-5; 188. On page 181 Sinclair says that "the characteristic structure of verbal groups is aux v. Aux stands for auxiliary verb, v for main verb."

<sup>10</sup>SINCLAIR, p. 157-9; 171-2. See chapter 1 for further details.

<sup>11</sup>Ibid. p.186.

<sup>12</sup>See T5N, text number five applied to the Nursing Group, in the list of all types of errors in ngps, in the texts administered to the Nursing Group.

<sup>13</sup>The same reasoning is applied to the translations of EARLY SCIENTISTS (T9P) into: a) 'antes cientistas', b) 'cedo cientistas', since 'antes' and 'cedo' were not linked to any other surrounding groups; if they had been translated as exponents of any other group, the addition of an article (a deictic) before the headwords 'cientistas', in both translations, had been achieved.

<sup>14</sup>A rankshifted group is usually presented between brackets. It is a convention employed by James Muir in A modern approach to English grammar. London, Batsford, 1972. 149p.

<sup>15</sup>SINCLAIR, p.209.

<sup>16</sup>Although Sinclair's description of a finer scale of delicacy at (m) - namely, d, o, e, and n - we have decided to maintain the use of (m) for all types of modifiers and submodifiers, for our main concern is not related to the classification of modifiers in itself. Moreover, in the division of the ngps according to the number of words which form each ngp,

some deictics, operating at d, have been excluded because they have not constituted a difficult element in the translation of ngps.

<sup>17</sup>A rankshifted clause is usually presented between a double pair of brackets. See note 14 above.

<sup>18</sup>The Portuguese word 'ligeiramente' as it has been used before the word 'môvel' gives rise to a meaning similar to the one conveyed either by SLIGHTLY-MOVING PARTICLE or SLIGHTLY-MOBILE PARTICLE, that is to say, a particle which moves slowly, or which can hardly move.

<sup>19</sup>Another possible translation might be: '(uma) partícula movimentando-se com rapidez', however, in relation to the rest of the text, the translation suggested in ii) seems to be more appropriate.

<sup>20</sup>We have chosen Av to indicate an adverb-head group, or a group with a lexical adverb as headword. See SINCLAIR, p.205.

<sup>21</sup>It should be remembered that our students are not to be viewed as translators although teachers cannot overlook the possibility of a rankshift which does not interfere with comprehension; we do not expect students to achieve appropriate transposition, or oblique translations without interference with comprehension, as it is expected from translators, according to AYORA, Gerardo Vázquez, already referred to in note 8 of chapter 4. From our students' performance we consider that the correct identification of the structural elements of a ngp of two or more words and the relationships underlying those structural elements are the least we can expect from them; if the underlying relationships of (m) and h require a rankshift as a translation equivalent at (m) EL I students are expected to be able to accomplish that rankshift at the appropriate (m), if there are two or more than two before h. As to this point, Widdowson refers to the difficulty which ngps of the following kind COPPER ELECTRODE, A CONDENSATION LOSS or A COMBUSTION CHAMBER can cause "because the grammatical relations underlying them can be quite different. 'A copper electrode' for example

is 'an electrode which is made of copper', where 'a condensation loss' is a loss which is caused by condensation and 'a combustion chamber' is a chamber which is used for combustion", in WIDDOWSON, H.G. Literary and scientific uses of English. English Language Teaching Journal. London, Oxford University Press, 28(4):277-359, July, 1974. p.290. The difficulty posed by some ngps has also been discussed by LEVI, Judith N. The syntax and semantics of complex nominals. New York, Academic Press, 1978. p.75-117.

Sopher states that another difficulty comprises the use of modifiers, usually adjectives and adverbs, which become qualifiers in the students' native language; AN EXTENSIVE HEAT-AFFECTED ZONE and AN EXTENSIVELY HEAT-AFFECTED ZONE are quoted by Sopher as examples of difficulties. In SOPHER, E. An introductory approach to the teaching of scientific English to foreign students. English Language Teaching Journal, London, 28(4):272-359, July, 1974. p.354. If our EL I students were required to translate these types of ngps, which we have quoted from Widdowson and Sopher, they should be able to insert a rankshifted group, or clause, at (q) as the Portuguese equivalent from one of the English modifiers.

<sup>22</sup>See Tables 3 and 4 in which the number of ngps in each text has been presented together with the error rate per student, in each ngp. Tables 5, 6 and 7 present the number of errors made, the number of ngps in each text, the error rate per student, in each ngp as well as the number of ngps according to the number of words which form the ngps, found in each text.

<sup>23</sup>We think that the translations of these deictics -A, AN, THE, THIS, THAT, THESE and THOSE - might also reinforce the same aspects of the problems which we have been dealing with: the incorrect identification of the headword in a ngp, or the change of an exponent at (m) into the headword of another ngp; however, to make the counting up of words forming a ngp a simpler procedure, we have decided to ignore those deictics.

<sup>24</sup>SINCLAIR. p.147. He says that "almost everything that occurs at (q) is rankshifted". He gives the following examples of rankshifted ngps at (q): A HAT THIS SIZE and THE MEETING

(m) h                      [q]                      (m)                      h

NEXT WEEK

[q]

<sup>25</sup>OSTLE, Bernard. Estadística aplicada. Mexico, Limusa, p.140-54. 302 wbt and irg errors out of a total of 1021 errors represent a ratio of the former to the latter of 1:2,38  $\approx$  1:2, that is to say,  $\frac{1}{3} : \frac{2}{3}$ . Thus, it has been decided that in

any type of text (either specific or non-specific ones) the occurrence of wbt/irg errors would be significant if their proportion were equal or higher than the proportion produced by the counting up of all types of errors, in ngps, to those 302 wbt and irg ones, in all the texts.

<sup>26</sup>CONOVER, Jay Williams. Practical nonparametric statistics. New York, J. Wiley, 1971. p.155. The test is given by

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{O_{ij} E_{ij}}{E_{ij}} \quad \text{with } (r-1)(c-1) \text{ degrees of freedom.}$$

$$i = 1 \quad j = 1$$

<sup>27</sup>See Appendices 3.1.1., 3.1.2., 3.1.3. and 3.1.4.

<sup>28</sup>See Appendices 3.1.1. and 3.1.2.

<sup>29</sup>See Appendix 3.1.3.

<sup>30</sup>See Appendix 3.1.4. and note 25, above.

<sup>31</sup>GUENTHER, William C. Introducción a la inferencia estadística. Madrid, Ed. del Castillo, 1968. p.153.

<sup>32</sup>See Appendix 3.2. and 3.2.1.

<sup>33</sup>See Appendix 3.2.1.1.

<sup>34</sup>GUENTHER, p.153.

<sup>35</sup>See Appendix 3.2.1.2.

<sup>36</sup>OSTLE, p.252-3.

<sup>37</sup>The correlation rate was obtained from the formula:

$$\rho_{xy} = \frac{\sum x \cdot y}{(\sum x^2 \sum y^2)^{1/2}}. \quad \text{See note 36, above.}$$



## CONCLUSION

The number and the quality of the errors made in ngps are evidence that these are actually a source of serious difficulty for the students with whom we have worked. The statistical tests have shown that the incidence of wbt and irg errors in the face of all the other types of errors, which have also been produced in the translation of English ngps, is relevant. These two types of errors as we have described them in chapter 5, are the ones which characterize those students' tendency to transfer the usual sequence of the structural elements in a Portuguese ngp to some English ngps found in the texts translated. The importance of this transference<sup>1</sup> lies in the fact that the equivalent Portuguese ngps as rendered by those EL I students are in complete interference with the message conveyed in the texts studied by both groups of students. It has become evident that students have not achieved any other kind of translation<sup>2</sup> which has not interfered with comprehension.

Except for the translation of A DUSTY ROOM (T9P) into 'na poeira da sala', which has also shown the influence of the sequence of English structural elements, plus the insertion of a rankshifted group - 'de uma sala' - no other examples of transposition without interference with comprehension have been produced.<sup>3</sup>

English ngps have posed difficulties to our EL I students in both specific and non-specific types of texts. Errors such as the ones below have shown that the difficulty has been posed independent of the relation between the content of the

text and the major disciplines taken by each group of students:

T1C (non-specific text)      Translations rendered by the  
Nursing and Physics Groups

EDUCATIONAL POLICY	educação política educação policial educacional política
THE COUNTRY'S UNIVERSITY	os países universitários
THE CHANGING NEEDS	mudanças necessárias mudanças precisas

T2C      Translations rendered by both  
groups: the Nursing and the  
Physics ones.

NEGROID RACES	negróide raças
SKIN COLOUR	pele colorida pele de cor pele e cor
HEAD SHAPE	cabeça moldada cabeça e forma

In the specific texts we have found the following examples of translation in each group of students:

<u>Nursing Group</u>	<u>Translations rendered</u>
SUBMUCOUS FIBROIDS (T9N)	submucos fibrosas submucos fibrados submuco fibróide submuco fibroso submucosa fibróides submucos fibróides
CHRONIC PULMONARY OR CARDIAC DISEASE (T8N)	crônico pulmonar do cardíaco doente crônica pulmonar ou cardíaca doença
THE RELATIVELY SUDDEN INABILITY (T12N)	a relatividade súbita da inabilidade o relativo súbito da inabilidade

TISSUE INJURY	(T6N)	tecido ofendido
		tecido mal
		tecido prejudicado

Physics GroupTranslations rendered

REINFORCED CONCRETE	(T4P)	reforçado com concreto
		reforço de concreto
THE VIOLET AND ULTRA-	(T7P)	
VIOLET END		violeta e ultra-violeta final
		violetas e ultra-violetas final
		a violeta, a ultra-violeta e o fim
		a violeta, a ultra-violeta, fim
A RAPIDLY-MOVING	(T9P)	
PARTICLE		um rápido movimento de partícula
		uma ligeira mudança de partícula
		uma ligeiramente móvel partícula
REQUISITE CONDITIONS	(T5P)	os requisitos condicionados
		os requisitos e condições
		os requisitos, condições
		planos de condições

Within the specific texts, ngps which cannot be said to belong strictly to technical terminology have also caused interference with the message conveyed. The ngps below have caused high percentages of wbt and irg errors among students of both groups.<sup>4</sup>

THE NEXT INSTANT	(T10P)	54,17%	(13 out of 24 students)
THE THIRD TRIMESTER	(T10N)	36,84%	(14 out of 38 students)
EVERYDAY THINGS	(T1P)	33,33%	( 8 out of 24 students)
ROOM AIR	(T4N)	28,95%	(11 out of 38 students)

The length of ngps was assumed to be a factor which might influence the production of wbt and irg errors. We assumed that errors, mainly the ones described as the wbt type, were unlikely to be caused by ngps formed by three or more words, since the very

length of the ngps might function as a factor which would make students aware of the incorrection of their translations; that is to say, the longer the ngps, the less probability of wbt error occurrence. However, the statistical test applied has shown that there is a dependence relationship between the number of words forming a ngp and the number of errors, though that cannot be said to be a cause-and-effect relationship. The problems posed by long ngps, formed by five or six words, might have been better evaluated if the incidence of long ngps had been significant in the texts translated. Nevertheless, our aim has been to present the difficulties encountered by our EL I students in pieces of written English taken as authentic materials. Any changes in the formation of ngps, or the inclusion of longer ngps in texts to be studied by EL I students should be made not only by an expert in the subject-matter presented in each text but also by one who mastered the English language. These alterations have not been our main concern, because we have been interested in viewing the problems faced by EL I students in texts as they are actually laid down for them.

The students' knowledge of the subject is one aspect which we have taken for granted; however, the facts have shown that errors have been made not only in ngps related to specific fields of study but also in ngps which are not restricted to their fields of study.

As EL I students are usually required to consult specific literature in English during their undergraduation courses, and in view of some lines of thought about the reading and comprehending process which we have mentioned in chapter 3, it is impossible to believe that they will make sufficient

progress in their ability to comprehend English texts, unless ways can be found to overcome this area, of difficulty.

## NOTE

<sup>1</sup>See chapter 3, note 47. CORDER, p.132.

<sup>2</sup>See chapter 5, note 21. According to Vinay and Darbelnet, in VINAY, J.P. & DARBELNET, J. Stylistique comparée du français et de l'anglais; méthode de traduction. Paris, Didier, 1972, p.46-55, there are two broad types of translation: the direct, or literal translation, and the oblique translation. Our students have not even achieved what they describe as literal translation - the one-to-one word correspondence without interference with comprehension - which, they say, is the most common type of translation applied to scientific texts, unless it does not give rise to: a message with another meaning, a meaningless message, or a message which is said to be 'impossible for structural reasons', or the one which corresponds to nothing in the metalinguistics of the target language, or which corresponds to any other thing but not at the same language level. By language level they mean "the stylistic characteristic or a language which depends on the particular field in which the speaker utilizes the language, e.g. juridical, administrative, commercial, scientific language" p.14.

<sup>3</sup>'(na) poeira de uma sala' has not been considered as an irg error because it has not interfered with the message conveyed in the text mentioned (T9P); we cannot, however, particularize the factors which led some students to render that sort of class-shift procedure, as described by Catford and also presented in chapter 1, note 13, assuming that they are not translators and that the development of translation techniques has not been one of the aims in EL I Course.

<sup>4</sup>See Appendix 2.2.4. - List of wbt and irg errors plus co-occurring aspects, with the percentage and number of students that made those errors.

## RECOMMENDATIONS

Some points need to be taken into consideration in face of the problems presented by the rendered translations of the ngps in the texts studied by those two groups. We know that students are not forced to take English in their first semester at the UFPB, however, one of the most probable motivating forces which makes most newly- admitted students take their EL I Course at the beginning of their undergraduation courses is the fact that they are generally required to read specific materials written in English. We know that students are recommended to consult specific literature in English since the very beginning of their academic life.<sup>1</sup>

One might argue that students should take their EL I Course at any other time after their immediate entrance at the UFPB; nevertheless, administrative reasons allow students to take English at any time of their undergraduation course and the DLEM cannot overlook the fact that most EL I students are taking their first semester at the UFPB and, consequently, it might think of the appropriateness of the material to be laid down for that course. Texts dealing with subjects which were undoubtedly familiar to students might be one of the factors which would minimize the probable linguistic problems posed by the texts studied in EL I classes, and, at the same time, texts of that kind might give the teacher the advantage of taking students to look for meaning beyond words.

To apply texts whose content was familiar to students might in fact minimize some difficulties and facilitate students'

ability to deal with language use; on the other hand, in real-life activities students are not always expected to come across texts whose contents are always familiar to them. The application of texts which would deal with up-to-date and interesting subjects might act as a motivating factor - for students are always interested in getting new information from texts - and those texts might also work as a possible means of verifying students' ability to deal with texts whose content, though belonging to students' major area of study, was not known by them. The actual mastering of the subjects presented in each text by students should be one aspect which would make the evaluation of their linguistic performance more precise. Then, teachers might also compare the results obtained from texts whose contents were certainly familiar to students with those from texts whose contents were not certainly familiar to them, so that the synchronization of students' knowledge of the subject with their linguistic performance might be better evaluated.

At a practical level, teachers should rethink their approach according to students' ability to read English texts.

Liisa Lautamatti<sup>2</sup> suggests that

"a reading course would be a general one, offered to all students and based on the mother tongue..."<sup>3</sup>

and she still states that

"if students are taught how to compensate for their insufficient knowledge of the foreign language by using all their previously acquired knowledge relevant to the task, they will develop not only the right kind of reading strategies but strategies for learning from written material, and a confident and independent



approach to reading."<sup>4</sup>

And as her last suggestion, she claims that reading-oriented learning materials need to be

"produced by language teaching experts in cooperation with reading experts and representatives of the field of study concerned."<sup>5</sup>

A similar approach has been put forward by Widdowson<sup>6</sup> who suggests that communicative abilities, previously related to linguistic skills operating on their (students') own language should be associated to the linguistic skills related to the foreign language. The teacher should make use of students' already acquired experience of language use and link

"their communicative abilities in their own language to the realization of these abilities in the language they are learning."<sup>7</sup>

Should ngps still persist as an area of linguistic difficulty, in both kinds of texts described above, that is to say, in texts whose content was certainly new to students as well as in the ones whose content was actually familiar to students', teachers should think of a practical approach to overcome the difficulties posed by ngps. One way of avoiding wbt and irg errors might be the presentation of ngps as elements operating at S,O,C o/s or A<sup>8</sup> in clause structure. Students would be led to recognize the boundaries of ngps and consequently their structural elements. Teachers might begin with a clause such as THAT MAN BOUGHT A CAR so that students might perceive the

S                      P                      O

exponents of each group without the risk of marking the exponents of these groups as THAT/ MAN BOUGHT/ A/ CAR.

The exponents operating at S might be enlarged by putting

in some other exponents, as DETERMINED and OLD. Thus, students would have THAT DETERMINED OLD MAN/ BOUGHT/ A CAR. The same would

be applied to A CAR, to which the following exponents might be added: A DARK GREY ITALIAN CAR. By doing so, students would be able to locate the headword if they were to compare

THAT MAN/   BOUGHT/   A CAR  
S                      P                      O

THAT DETERMINED OLD MAN/ BOUGHT/ A DARK GREY ITALIAN CAR  
S P O

Dividing the clause into its structural elements, teachers might take the first step to avoid wbt and irg errors.

Paraphrasing ngps to cause the underlying relationships of their structural elements to be expounded, might also be a useful technique to reinforce the recognition of ngp structural elements and avoid unnecessary as well as inadequate insertion of rankshifted groups, without mentioning those errors which we have described as wbt ones. The examples provided by Widdowson and Sopher<sup>9</sup> are illustrations of paraphrasing which could be exploited by teachers. Thus, if students were given the ngps TISSUE INJURY (T6N) and STEEL WIRES (T4P) to be paraphrased,<sup>10</sup> either in English or in Portuguese, they would certainly feel the need to compare the message obtained from the paraphrased ngps with the rest of the text, to see whether there had been any interference with the message conveyed by the whole text.<sup>11</sup> The recognition of each structural element would possibly follow.

Another type of approach which might be helpful to draw students' attention to the sequence of English ngp structural elements is to make students translate ngps expounded by one word

only, and gradually add a number of modifiers. The translation of ngps which were gradually being enlarged might be an attempt to help students to identify the position of headwords and modifiers. The translation, for instance, of the ngp A NEW UNIVERSITY TEACHING LAW (TIC) might begin with:<sup>12</sup>

A	LAW -
A TEACHING	LAW -
A UNIVERSITY TEACHING	LAW -
A NEW UNIVERSITY TEACHING	LAW -

The selection of the texts to be studied by EL I students deserves special attention to take students to attain the objectives pursued by the course. The effect which a real familiarity with the topics might have on the percentage of errors may be an elucidating factor of other difficulties, for problems posed by ngps are unlikely the only ones to be faced by EL I students.

## NOTES

<sup>1</sup>See declarations provided by the Director of the Centre of Health Sciences and the Head of the Physics Department at the Federal University of Paraíba, about the specific literature in English to be consulted by students. Appendix 4.

<sup>2</sup>LAUTAMATTI, Liisa. Developing materials for teaching reading comprehension in a foreign language. In: BRITISH COUNCIL. English Teaching Information Centre. The teaching of comprehension. London, 1978. p.92-109.

<sup>3</sup>Ibid. p.107.

<sup>4</sup>Ibid.

<sup>5</sup>Ibid.

<sup>6</sup>WIDDOWSON, H. G. Teaching language as communication. Oxford, Oxford University Press, 1978. p.74.

<sup>7</sup>Ibid.

<sup>8</sup>Refer back to chapter 1.

<sup>9</sup>See note 21, in chapter 5.

<sup>10</sup>Those ngps might be paraphrased as 'injury caused in tissue' and 'wires made of steel', respectively.

<sup>11</sup>It is important to emphasize that students were not told about our intention of analysing specially the problems posed by ngps. From most of the rendered translations, we have noticed that some students were not always testing the message conveyed by each ngp against the message conveyed by the text as a whole.

<sup>12</sup>CORDER, p.293. He suggests that a technique of correction "might be a comparison of the reconstructed form with its translation equivalent in the mother tongue of the learner".

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## APPENDIX 1

### 1. TEXTS

#### 1.1. Non - specific texts

(Texts common to both groups - Physics Group and Nursing Group)

#### EDUCATION IN BRAZIL - TIC

During the last ten years, the Brazilian educational system has undergone many reforms aimed at making the system more appropriate to the country's developmental needs. The first step in this direction was taken in 1961 with a guideline and teaching law. This law outlined the Public Authority's responsibilities in education and also set guidelines for the educational system in both public and private institutions at grammar, high school, and college levels.

Through a series of laws and decrees on national education passed between 1961 and 1971, the basic orientation and educational policy, the organization and structure of education, the curricula, and all other aspects of education have been reorganized to adjust the educational system to the changing needs of the society. The Ministry of Education and Culture supervises education throughout the federal school system, and the Federal Educational Council is responsible for preparing plans for the national educational system as a whole.

In 1971, the Federal Government enacted legislations

which established guidelines for primary and secondary teaching. Primary teaching includes an eight-year scholastic term. The secondary school comprises a three-year scholastic term. A characteristic of the reform of high school education is, therefore, to provide a professional qualification at high-school level.

A new university teaching law determined the reform concerning the country's universities. This legislation set guidelines for the academic and administrative activities of the universities, and dealt with the following matters: definition of teaching, research, and extension objectives related to university academic activity; university teaching methods based on two cycles, the basic and the professional; creation of a department system as a way to simplify and motivate academic activity; adoption of a register system by semester; adoption of a system of credits as a measure of academic activity.

After completing university studies (three to six years) a student receives a diploma conferring the degree of Bachelor in law, philosophy, letters, etc; the degree of Licentiate in the field of education, or a title in professions such as medicine, engineering, etc.

#### RACE AND HEREDITY - T2C

Since the people of the world vary in their susceptibility to certain diseases as well as their skin colour, hair type and head shape, the genetic constitution of the population can influence patterns of health and disease. Though

few genes, if any, are confined in a race, in general the more distant populations are from each other, the more distinctive are their characteristics. Between these, people of Central and South Africa and the Caucasians of Scandinavia are examples of extremes. They resemble the intervening Semitic peoples surrounding the Mediterranean. Such genetic diversity is a biological asset that has nothing to do with ideas about racial 'superiority', or 'inferiority'. A species whose genetic constitutions have altered when environment changes as has happened to the human species, is more likely to survive.

The variant in susceptibility to disease that is part of the ethnic variation is best illustrated by diseases that affect the blood (which is easy to study by chemical-microscopic methods). Sickle-cell anemia, for example, which provides protection against malaria, is virtually confined to peoples of the east, west and Central African origin, and to isolated places in India. Mediterranean peoples suffer from thalassemia, another hereditary form of anemia, that seems, like sickle-cell anemia, to protect people from malaria.

No such ready explanation can be found for contrasts in susceptibility of Rh sensitization between peoples of the north and those of Africa and Asia. Among Europeans, 15 per cent of the population have Rh-negative blood; among South African negroes only 5%; among Chinese and Japanese only 2%. Because the components of the Rh-negative factors are combined differently in the blood of European mothers, the risk of anemia resulting from Rh sensitization is even greater for European children than the high proportion of the Rh-negative blood

suggests.

The importance of some ethnic characteristics emerges only in certain environments. The tall, thin shape of the tribes of Equatorial Africa, for example, is an advantage in their hot climate: larger body surfaces in relation to body weight mean efficient heat loss. In the Arctic, Eskimo body types are short, heat preserving physiques. The dark pigment of the African skins helps to protect against sunburn, but it also reduces Vitamin D formed in the skin through exposure to the tropical sun. Racial and genetic variation is clearly important to health, and doctors must take this into account. But the majority of human sickness affects all races, and the environmental forces in general outweigh genetic factors.

## 1.2. Specific Texts

### 1.2.1. Texts translated by the Physics Group

#### TIP - Text number 1 - Physics

##### ELECTRIC MOTORS

The electric motor is undoubtedly one of the most helpful modern inventions. It is used in factories to drive machinery for electric trains, for trolley-buses and to power such everyday things as food mixers, polishers, vacuum cleaners, record players, drills, sewing machines and electric razors.

What makes this sort of motor so popular? One reason is its efficiency. Figures show that it is much more efficient than steam engines, or petrol engines. It is simple to work; it does not shake, it is fairly silent; it has few moving parts, and therefore gets little wear and tear. It can be easily started, speeded up, slowed down and stopped. In fact for most

purposes it is ideal.

The electric motor has one great disadvantage; it has to be supplied with electricity. It must either be connected to an electric supply line or to a very heavy battery. This is why the electric motor is unsuitable for cars, motor cycle and so on. But many machines do not need to be moved about, or at any rate they can be attached to a power point. For all these machines the electric motor can be used.

T2P - Text number 2 - Physics

### CORROSION

This is the slow, gradual attack made on the surfaces of metals and alloys by the atmosphere or by the water. The best known example is the rusting of ordinary iron and steel, but most metals corrode, though some more slowly than others. Tens of thousands of iron and steel are washed into the sea as rust from the United Kingdom alone, and at least £50 million is spent annually in Great Britain in preventing corrosion.

The processes that attack exposed metals, both pure metals and alloys are essentially chemical. The simplest of them is tarnishing, which is usually the result of a gentle reaction between the metal and a gas - that is, the atmosphere around us. Sometimes oxygen combines with the metal to form an oxide: more frequently the air, containing traces of sulphur compounds, reacts with the metal to produce a thin layer of metallic sulphide. The blackening of silver and the darkening of copper and brass are well-known examples of tarnishing.

When a metal tarnishes something is added to its surface and adheres to it; but in corrosion the metal is usually slowly eaten away. One cannot say that metal always resists corrosion better than another. The 'noble' metals, platinum, gold, and silver resist corrosive attack from either the atmosphere or sea water; but these are far too expensive to be used by engineers except in very special cases. Stainless steel also resists corrosion in many circumstances, though not in all, but it, too, is expensive.

### T3P - Text number 3 - Physics

#### MATERIALS

Material can be defined as the substance of which a thing consists or is made. We use a great variety of materials. Some of these materials have unique properties. Some are hard, others are soft, light, heavy, brittle, elastic, colourful, opaque, etc.

Consider the variety of materials used every day. Wood is used in furniture because it is easy to shape and is hard-wearing. Porcelain is used for dishes as it can be easily washed and is stain-resistant. Clothes are made of cloth that can be sewn, shaped, dyed with ease. Paper, cheap to produce and easy to write or print on, is used in the manufacture of books. Nowadays plastic is used in increasing quantities. It is light, colourful, easy to clean and safe.

Not only do we choose specific materials for certain jobs but particular grades of these materials may be specified. Thus a special kind of wood may be used for a certain purpose.



Newsprint is used in the production of newspapers owing to its relative cheapness.

Doubtless as man becomes more and more sophisticated in his requirements there will be need for continual research to provide a wider range of new and better materials.

#### T4P - Text number 4 - Physics

### CONCRETE

Nowadays the skeleton or frame of a building is usually either made of structural steel or reinforced concrete. Concrete is made by mixing together small stones, sand, cement and water. It can be made by hand but it is usually mixed in a rotating cylinder. When it is ready it is poured into molds made of wood or metal. The stones that are mixed in the concrete give the mixture strength; the sand fills the spaces between the stones and the cement secures the mixture together.

The less water we use to mix cement, the stronger it will be. The difficulty however is that it is much more difficult to mix if little water is used. When very strong concrete is needed it is mixed with a minimum of water, placed in forms or molds and then "vibrated" with metal bars that operate from electricity or compressed air. This vibration removes air bubbles and produces a good mixture.

Engineers reinforce concrete with steel and wire to make it resistant to bending. These metal reinforcements are put in the molds before the concrete is poured in.

Usually in a concrete beam, much of the concrete simply holds the steel reinforcement in position. It can be used much more effectively if it is 'stressed' before being subject to an external load. Concrete can be 'pre-stressed' in two ways. In the first method, the concrete is poured around stretched steel wires which are released only when the concrete has set. The other method is to pour the concrete around polythene tubes. When the concrete sets, steel wires are pulled through the tubes and stretched. This is called 'built in' stress.

In order to save time, many builders prefer to use a number of prefabricated units. The use of prefabricated concrete units has made it possible to build very rapidly.

T5P - Text number 5 - Physics

#### CAN LIFE EXIST ON THE PLANETS? (Part One)

(From chapter VII of THE UNIVERSE AROUND US by SIR JAMES JEANS, F.R.S.)

Actually we know of no type of astronomical body in which the conditions can be favourable to life except planets like our own revolving around the sun. Even these may be too hot or too cold for life to obtain a footing. In the solar system, for instance, it is hard to imagine life existing on Mercury or Neptune since liquids boil on the former and freeze hard on the latter.

Even when all the requisite conditions are satisfied, will life come or will it not? We must probably discard the at

one time widely accepted view that if once life had come into the universe in any way whatsoever, it would rapidly spread from planet to planet and from one planetary system to another until the whole universe teemed with life; space now seems too cold, and planetary systems too far apart.

T6P - Text number 6 - Physics

#### CAN LIFE EXIST ON THE PLANETS? (Part two)

Our terrestrial life must in all probability have originated on the earth itself. What we should like to know is whether it originated as the result of some amazing accident or succession of coincidences or whether it is the normal event for inanimate matter to produce life in due course when the physical environment is suitable. We look to the biologist for the answer, which so far he has not been able to produce. ...

Apart from the certain knowledge that life exists on earth, our only definite knowledge is that, at the best, life must be limited to a tiny fraction of the universe. Millions of millions of stars exist which support no life, which have never done so and never will do so. Of the planetary systems in the sky, many must be entirely lifeless, and in others life, if it exists at all, is probably limited to a few of the planets.

T7P - Test number 7 - Physics

#### THE QUANTUM THEORY OF RADIATION

(From chapter VII of AN APPROACH TO MODERN PHYSICS)

by E. N. DA C. ANDRADE)

(Part one)

Now, before the quantum theory was put forward, there was no notion of natural units of radiant energy: it was believed that we could have any amount of energy, as small as we pleased, radiated by a hot body or a luminous atom. It could however, be shown mathematically that, if this were true, we should expect a hot body to radiate nearly all its energy in the violet and ultra-violet end of the spectrum, which we know to be against the facts of observation.

The problem was solved in the first year of the present century, when Planck showed that, to get the right result, it was necessary to make a revolutionary hypothesis: to suppose that radiant energy was sent out in packets, as it were - in units or atoms of energy, just as matter existed in atomic units. We cannot have less than an atom of lead, say; any minute piece of lead must consist of a whole number of atoms. We cannot have an electric charge of less than an electron. In the same way, we cannot have less than a unit - or quantum, as it is called - of radiant energy, and any body that sends out or absorbs radiation must deal with one quantum or a whole number of quanta.

The little parcel of light of one particular frequency in which radiant energy is delivered is sometimes called a 'light dart', a very expressive term, but it is more generally known as a photon. The photon is simply a quantum of radiant energy, the only object of sometimes using the new term

being that 'quantum' is a more inclusive term, which can be applied to other things as well as light - for instance - to the vibration of whole atoms and molecules.

#### T8P - Text number 8 - Physics

#### THE QUANTUM THEORY OF RADIATION (Part two)

The quantum of radiant energy differs from the quantum of electricity, the electron, in a very important way. The amount of charge is the same on all electrons: there is but one unit. The magnitude of this unit of radiant energy, however, is different for every different wave-length of radiation. It is, in fact, proportional to the frequency, so that the quantum of energy of extreme visible red radiation is only half that of the extreme visible violet radiation, which, as we have said before, has double the frequency. The quantum of an X-radiation is very much greater than the quantum of any visible radiation.

The quantum of energy corresponding to a given species of radiation is found, then, by multiplying the frequency by a certain fixed number, which is called Planck's universal constant, and always indicated by  $h$ . Planck's constant enters into every aspect of modern atomic physics and its numerical value has been found by at least ten different methods, involving such things as X-ray properties, the distribution of energy in black-body radiation, the frequencies of spectral lines, and so on. All the methods give values agreeing to within a few parts in ten thousand.

Light, then, or radiation in general, has a packet

property as well as a wave property, and this is one of the paradoxes of physics. Newton's conception of light was a stream of particles, which he endowed with something in the nature of pulsating properties in an attempt to account for certain phenomena which we can now easily explain on the wave theory. He felt the need for the double aspect, the particle and the periodic, and provided for it in his theory.

T9P - Text number 9 - Physics

### PARTICLES OR WAVES?

(From THE MYSTERIOUS UNIVERSE by James Jeans)

(Part one)

The most obvious fact about a ray of light, at any rate to superficial observation, is its tendency to travel in a straight line; everyone is familiar with the straight edges of a sunbeam in a dusty room. As a rapidly-moving particle of matter also tends to travel in a straight line, the early scientists, rather naturally, thought of light as a stream of particles thrown out from a luminous source, like shot from a gun. Newton adopted this view, and added precision to it in his 'corpuscular theory of light'.

Yet it is a matter of common observation that a ray of light does not always travel in a straight line. It can be abruptly turned by reflection, such as occurs when it falls on the surface of a mirror. Or its path may be bent by refraction such as occurs when it enters water or any liquid medium; it is refraction that makes our oar look broken at the point where it

enters the water, and makes the river look shallower than it proves to be when we step into it. Even in Newton's time the laws which governed these phenomena were well known. In the case of reflection the angle at which the ray of light struck the mirror was exactly the same as that at which it came off after reflection; in case of refraction, the sine of the angle of incidence stood in a constant ratio to the sine of the angle of refraction.

T10P - Text number 10 - Physics

#### PARTICLES OR WAVES? (Part two)

Newton's corpuscular theory met its doom in the fact that when a ray of light falls on the surface of water, only part of it is refracted. The remainder is reflected, and it is this latter part that produces the ordinary reflections of objects in a lake, or the ripple of moonlight on the sea. It was objected that Newton's theory failed to account for this reflection, for if light had consisted of corpuscles, the forces at the surface of the water ought to have treated all the corpuscles alike; when a corpuscle was refracted all ought to be, and this left water with no power to reflect the sun, moon or stars. Newton tried to obviate this objection by attributing 'alternate fits of transmission and reflection' to the surface of the water - the corpuscle which fell on the surface at one instant was admitted, but the next instant the gates were shut, and its companion was turned away to form reflected light. This concept was strangely and strikingly anticipatory of modern quantum theory in its abandonment of the uniformity of nature and its replacement of determinism by probabilities, but it failed to carry conviction at the time.

T11P - Text number 11 - Physics

## THE THEORY OF CONTINUOUS CREATION

(From chapter V of THE NATURE OF THE UNIVERSE by  
Fred Hoyle)

We must move on to consider the explanations that have been offered for this expansion of the universe. Broadly speaking, the older ideas fall into two groups. One was that the universe started its life a finite time ago in a single huge explosion, and that the present expansion is a relic of the violence of this explosion. This big bang idea seemed to me to be unsatisfactory even before detailed examination showed that it leads to serious difficulties. For when we look at our own galaxy there is not the smallest sign that such an explosion ever occurred. But the really serious difficulty arises when we try to reconcile the idea of an explosion with the requirement that the galaxies have condensed out of diffuse background material. The two concepts of explosion and condensation are obviously contradictory, and it is easy to show, provided that you postulate an explosion of sufficient violence to explain the expansion of the universe, that condensations looking at all like the galaxies could never have been formed.

T12P - Test number 12 - Physics

## ATOMIC RADIATION AND LIFE

The radiation dose given off by an X-ray machine or by isotopes is usually measured by determining the number of



ions produced in a volume of gas. Since these carry an electric charge there are a number of extremely delicate methods by which they can be detected. The widely used Geiger counter consists essentially of a wire stretched inside a cylindrical tube, so arranged that an electric current can pass between the wire and the tube only when there are ions in the gas. Consequently, when an ionizing particle passes through the tube, an electric signal is given out. In this way the number of ionizing particles given off by a radio-active source can be accurately counted. This is called the activity of the material. It is measured in a unit called the 'curie' after the discoverer of radium. The activity of one gram of radium together with its decay products is equal to one curie. Every time an atom disintegrates a beta- or alpha-ray is given off together with a certain amount of gamma radiation. The activity in curies can tell us nothing about the dose of radiation given off by the radio-active material, since the curie measures only the number of ionizing particles emitted, independent of their range or energy.

(From chapter I of ATOMIC RADIATION AND LIFE, by  
Peter Alexander.)

#### 1.2.2. Texts translated by the Nursing Group

T1N - Text number 1 - Nursing

#### THE NERVOUS SYSTEM

We have a number of special nerves which pick up

information from the outside world and send it back to the brain. The eye has special nerves which are sensitive to light. At the back of the eyeball there is a layer called the 'retina' containing millions of nerve cells which react to light rays, almost like the film in a camera. The lens of the eye puts a sharp picture of the outer world on the nerve cells of the retina. Each cell which sees a spot of light sends a signal back to the brain, where the pictures are put together as a complete mental picture.

In the ear are nerves which react only to the energy of sound waves in the air. The outer ear helps to collect the sound waves and concentrate them on the eardrum. The thin, flexible drum moves back and forth in time with the sound waves. The tiny vibrations on the eardrums are passed through a series of small bones to the inner ear. In the inner ear is a spiral, shell-like structure - the cochlea. Each nerve in this structure reacts to the sound waves of only one frequency. The brain recognizes the signals from these nerves as sound-music, the human voice, thunder, the dinner bell, etc. The inner ear also contains a special group of nerves that are not connected with the sense of hearing. These nerves are attached to three tiny doughnut-shaped hollow tubes called the 'semicircular canals'. All three tubes are filled with a liquid. When you move your head, the liquid moves, too. The signals from these nerves help us to keep our balance.

Other kinds of nerves in the tongue and in the nose detect the presence of certain molecules. Thus, we can taste and smell different substances. Special kinds of nerve cells in the skin detect heat, cold, pressure or pain. These nerves are

very closely packed together in the fingertips but are more separated on the back and other less sensitive areas of the body.

Most of the cells in the nerve system are in the cerebrum. This part of the brain is deeply folded and divided into left and right hemispheres. The cerebrum is the part of the brain that receives the signals of sight and sound.

T2N - Text number 2 - Nursing

#### LATEST IN HEALTH AND MEDICINE

For the first time solid evidence linking the incurable disease multiple sclerosis with an infectious virus has been found by researchers in New York and Pennsylvania. The malady attacks the brain and the spinal cord. Symptoms casually appear in victims in their 30's. Speech becomes slurred. The eyeballs flick up and down and back and forth. Gradually the victim loses eye sight and becomes progressively paralyzed. Only in the last few years have scientists found clues to what causes MS. In 1972, Dr. R. I. Carp and colleagues at the Institute of Research on Mental Retardation, Staten Island, injected mice with material from the brain and other tissues of MS patients and discovered a resultant drop in the white blood cells - a sign of virus infection. They also found that the viral agent multiplied in the brains of test animals and could be transmitted from mouse to mouse. Now, a husband-and-wife team, Drs. Werner and Gertrude Henle, in Philadelphia, has confirmed the presence of this virus in similar tests with rats, hamsters and guinea pigs. They also detected the virus in the blood of MS patients.

"We still do not know if this virus is the main virus that causes MS", caution the Henles. "It is only a candidate".

Establishing MS as an infectious disease poses a basic question: Why do some people get MS while others, perhaps members of the same family do not? The answer may lie in the discovery by the researchers that the blood of nurses and relatives who tend MS patients carries an antibody against the disease.

In East Africa, where MS is virtually unknown, the population in general has this same antibody in the blood, indicating that the people were once infected but developed an immunity.

Scientists know that MS follows certain patterns. It is, for example, more prevalent in temperate zones than in tropical regions, and occurs in industrialized countries more often than in underdeveloped nations.

One theory is that in the less-developed nations the MS virus strikes almost all the population at an early age, establishing a basic immunity.

These studies on MS antibodies suggest that the virus is much more widespread than the disease itself and that MS may occur only in individuals genetically or otherwise predisposed to it.

T3N - Text number 3 - Nursing

The lymph drainage system of the right colon, almost

all the way to the left colic flexure, goes first to the marginal lymph nodes and then to the lymph node stations located along the right colic arteries all the way to their point of origin from the superior mesenteric artery. So the lymphatic hilus of the right and transverse colon is represented by lymph nodes placed at the root of the middle colic artery. The lymph drainage system of the descending colon, sigmoid colon, and rectum goes first to the marginal lymph nodes and then to the lymph nodes located at the root of the inferior mesenteric artery, which represents the lymphatic hilus of the left half of the colon. The next emplacements of lymphatic drainage are the lymph node stations located on either side and in front of the aorta and inferior vena cava.

Tumors of the anus and anal canal, as they diffuse along the lymphatics, metastasize also into the inguinal lymph nodes.

T4N - Text number 4 - Nursing

#### ACUTE RESPIRATORY FAILURE

(From CURRENT THERAPY, 1975, section 2, p. 86)

Respiratory failure results from impairment of gas exchange between alveolar air and blood. When the impairment is severe, gas exchange will be inadequate to meet the patients' needs; this leads to carbon dioxide retention, reflected by high partial pressure of carbon dioxide in the arterial blood and hypoxemia when the patient is breathing room air. Respiratory failure may be either acute or chronic.

Lung disease, particularly chronic obstructive lung

disease, is often thought to be synonymous with respiratory failure. However, one should remember that respiration requires an integrated feedback control system which involves the central nervous system, respiratory muscles, thoracic cage and upper airways. Disease of any portion of the system may lead to inadequate ventilation and respiratory failure. Table 1 enumerates diseases which commonly cause respiratory failure...

#### Diseases of brain

#### Examples

Brain	Intracranial bleeding Cerebrovascular accidents Head trauma
Spinal cord	Poliomyelitis Guillain-Barré syndrome Spinal cord trauma Cervical, vertebral fracture
Chest wall	Rib fracture with flail chest
Upper airways	Tumor of cords Laryngospasm
Lower airways and lungs	Bronchitis Asthma Emphysema Severe pneumonias
Heart	Congestive heart failure

### CYSTITIS

Cystitis rarely is a primary condition. It usually is secondary to an infection of the kidney, prostate or urethra. The bladder epithelium normally is highly resistant to infection, but continued drainage of infected urine from a pyelonephritis, infected drainage from an epididymovesiculitis or prostatitis, prolonged irritation from foreign bodies or calculi, ascending infection from a diseased urethra, or prevention of normal bladder emptying by a hypertrophied prostate, urethral stricture, or neurogenic disturbance, may so wear down tissue resistance that disease is established. Following major surgical procedures, childbirth and prolonged bed rest, lowered resistance, plus inadequate bladder emptying, predispose to the development of cystitis.

### TREATMENT OF ACUTE RENAL FAILURE

Acute renal failure may be avoided by preventing the occurrence of, or minimizing the duration and severity of shock, tissue injury, or sepsis. Fluids, pressor agents, or blood should be administered liberally until it is clear that despite restoration of circulatory integrity, marked oliguria is persisting. Thereafter, continued administration of large volumes of fluid in the presence of pronounced renal damage will lead to overhydration. In the event of hemolytic reaction after mismatched transfusion, the severity of subsequent acute tubular necrosis is inversely proportional to the degree of hydration.

T7N - Text number 7 - Nursing

## LIVER AND BILIARY TRACT

The liver, the largest secreting organ in the body, possesses a major degree of reserve functional capacity, unusual resistance to damage by noxious substances, and extraordinary powers of regeneration. Up to 80% of the liver cells may be damaged without producing severe symptoms, and complete recovery may ensue. The functions of the liver are many, but accurate information concerning them is far from complete.

The functional unit of the liver, the hepatic lobule, may be considered as a tube (bile capillary) the walls of which are in juxtaposition with cords of liver cells; one end empties into a bile duct, while the other end is closed. Bile is excreted from small canaliculi into the larger capillary and thence into the duct. Blood from the portal vein enters one end of this unit, filters past and between the cords of liver cells, and exits into the hepatic vein. Blood from the hepatic artery supplies the cells and also empties into the hepatic vein.

T8N - Text number 8 - Nursing

## BRONCHITIS

In the usual infectious form, acute bronchitis is part of a general acute upper respiratory infection. Onset may develop from the common cold, or from a pyogenic or virus infection of the nasopharynx, throat, or tracheobronchial tree.

Acute bronchitis is most prevalent in winter. Predisposing or contributory factors are exposure, chilling,



fatigue, malnutrition, rickets. It is commonly a mild disease, but may be serious in debilitated patients and those with chronic pulmonary or cardiac disease; the special danger is the development of pneumonia.

Recurring attacks suggest a focus of infection, such as chronic sinusitis, bronchiectasis or, in children, hypertrophied tonsils and adenoids. Allergic factors frequently are important. Acute bronchial irritation and inflammation may be caused by such physical and chemical irritants as mineral and vegetable dusts of various kinds, strong acid fumes, ammonia, certain volatile organic solvents, chlorine, hydrogen sulfide, sulfur dioxide, or bromine. Tobacco smoke (1st or 2nd hand) is a tracheobronchial irritant for many individuals.

(From THE MERCK MANUAL OF DIAGNOSIS AND THERAPY, p. 1306)

T9N - Text number 9 - Nursing

#### HABITUAL ABORTION

Defined as three successive spontaneous abortions, this is uncommon (0.33 per cent) and requires a more comprehensive evaluation of the couple to rule out systemic, endocrine or cytogenetic factors. In the first trimester endocrine deficiencies (luteal phase of steroid production) are the more common factors. In the second trimester the cause is usually anatomic factors of either congenital or pathologic origin. If these are not recognized, they serve as the basis for repeated abortions which most often require surgical treatment. The anomalies that may produce habitual abortion are septate or bicornuate unicollis uteri; the double or didelphic uterus will usually carry pregnancies

to term. A fixed retrodisplaced uterus, resulting either from adhesions from endometriosis or from an old healed inflammatory process, occasionally plays a part. Submucous fibroids may be a silent or symptomatic cause.

(From CURRENT THERAPY, 1975. p. 716)

T10N - Text number 10 - Nursing

#### PLACENTA PREVIA

Placenta previa is a term used to describe implantation of the placenta within the lower uterine segment. This phenomenon occurs in 0.5 to 1.0 per cent of pregnancies in the third trimester; a higher incidence in early pregnancy is explained by the fact that the condition is frequently associated with early abortion. The classification of placenta previa depends on the degree of coverage of the lower uterine segment. In placenta previa centralis the internal cervical os is totally occluded by the placenta; placenta previa marginalis indicates a partial encroachment upon the os; low implantation of the placenta is used to describe placentas which are attached to the lower uterine segment. Advancing maternal age and increasing parity predispose to the development of placenta previa; the condition is perhaps related to defective vascularization of the decidua or unfavorable uterine environment shortly after conception.

T11N - Text number 11 - Nursing

#### PYELONEPHRITIS

The most common variety of interstitial nephritis

is that of bacterial origin, commonly referred to as pyelonephritis. Unfortunately interstitial nephritis and bacterial nephritis have become synonymous in many circles irrespective of the presence of urinary infection. The majority of cases of interstitial renal disease are due either to urinary obstruction or to infection of the renal parenchyma or both. Unlike other nephropaties, interstitial nephritis is usually patchy in its distribution so that one finds diseased areas alternating with healthy or much less diseased areas. This becomes an important diagnostic point for the treatment of chronic disease, in that cortical atrophy, with recurrent disease, may be noted radiographically by intravenous urography. Also, renal biopsy has been of much less help than in the study of glomerular pathology.

(From CURRENT THERAPY, 1975 p. 480)

T12N - Text number 12 - Nursing

#### ACUTE RENAL FAILURE

The presentation of acute renal failure may occur in several ways; it may be deceptive and subtle with ultimate awareness of the gravity of the situation by the physician precipitated by serious symptoms of uremia or evidence of gross chemical derangement; it may be immediately apparent by an observed decrease in the urine output; or it may occur in a situation known to result in renal failure despite the best attempts at prevention. Acute renal failure in its broadest sense represents the relatively sudden inability of the kidneys to excrete the necessary amounts of water, salts (sodium and

potassium) acids, and products of metabolism so that an accumulation of these substances occurs.

T13N - Text number 13 - Nursing

### DYSPEPSIA

Indigestion may be caused by organic disease in the gastro-intestinal tract and by many diseases originating elsewhere. Consideration will be given here mainly to symptoms that occur in the absence of demonstrable organic disease.

Common causes are eating too much or too rapidly, inadequate mastication (frequently due to poor dentition) eating during emotional upsets or severe mental strain, and swallowing large amounts of air. Other factors are excessive smoking; constipation; and ingestion of poorly cooked foods, those with high fat content and others such as cucumbers, radishes and gas-forming vegetables (e.g. beans, cabbage, turnips, onions).

Most of the symptoms result from altered gastric motor activity. Fats inhibit such activity, decrease peristalsis, lower gastric tone and prolong gastric emptying time. Moderate distension of the stomach stimulates motility, while marked distension, such as occurs from overeating, inhibits motility and may produce a sensation of epigastric distension and fullness and nausea. Nervousness and anxiety tend to increase peristalsis, while fear, shock, depression, pain and physical fatigue tend to inhibit it and reduce gastric tone.

## CALCULI

The cause is unknown. Calculi probably begin on the renal papillae as small plaques which break free and act as nuclei around which urinary salts are precipitated.

The size of a calculus varies from very small gravel to a large stag-horn stone which may fill the renal pelvis. Calcium oxalate stones usually are small, dark, rough and hard, while calcium phosphate stones tend to be soft, white, chalky and frequently stag-horn in shape. Uric acid stones commonly are small and yellow but they may be of any color. Cystine calculi have a waxy, almost transparent appearance. Calculi may be multiple and bilateral. Migration of a stone may cause obstruction with resultant stasis, infection and clinical manifestations. Persistent or repeated obstruction leads to pyonephrosis or hydronephrosis.

## APPENDIX 2

### 2. Errors

#### 2.1. General list of errors in ngps.

##### 2.1.1. All types of errors in nominal groups in texts common to both groups of students

TLC - Both groups

Text - EDUCATION IN BRAZIL

Nº of translations: 62

(Nursing Group: 38)

(Physics Group: 24)

#### THE CHANGING NEEDS

- |                                |      |
|--------------------------------|------|
| 1. as necessidades e mudanças  | (5)  |
| 2. as mudanças necessárias     | (15) |
| 3. as necessidades de mudanças | (7)  |
| 4. as mudanças                 | (1)  |
| 5. mudanças nas necessidades   | (1)  |
| 6. mudanças precisas           | (2)  |
| 7. as necessidades             | (4)  |

#### THE COUNTRY'S DEVELOPMENTAL NEEDS

- |   |     |
|---|-----|
| 8. o necessário desenvolvimento do país                   | (5) |
| 9. o desenvolvimento do país                              | (5) |
| 10. o desenvolvimento que o país precisa                  | (1) |
| 11. as necessidades do país                               | (4) |
| 12. as necessidades desenvolvimentais do país             | (5) |
| 13. o desenvolvimento necessário do país                  | (7) |
| 14. as necessidades do desenvolvimento que o país precisa | (1) |
| 15. o desenvolvimento de um novo país                     | (1) |
| 16. em país em necessidade de desenvolvimento             | (1) |

- |  |     |
|--|-----|
| 17. as necessidades do país em desenvolvimento | (1) |
| 18. as necessidades de um país desenvolvido    | (2) |
| 19. do país que precisa se desenvolver         | (2) |
| 20. que os países desenvolvidos precisam       | (1) |
| 21. o desenvolvimento preciso do país          | (1) |
| 22. o país do desenvolvimento preciso          | (3) |

#### TEACHING LAW

- |                          |     |
|--------------------------|-----|
| 23. o ensino de leis     | (4) |
| 24. o ensinamento de lei | (2) |
| 25. (para) ensinar lei   | (2) |
| 26. a lei ensinando      | (6) |

#### THE PUBLIC AUTHORITY'S RESPONSIBILITIES

- |  |     |
|--|-----|
| 27. pública autoridade responsável                             | (1) |
| 28. a responsabilidade na educação das autoridades<br>públicas | (1) |
| 29. os direitos de publicidade responsáveis                    | (1) |
| 30. o governo público como responsável                         | (1) |
| 31. públicas autoridades responsáveis                          | (6) |
| 32. (ao) público as autoridades responsabiliza                 | (1) |

#### BOTH PUBLIC AND PRIVATE INSTITUTIONS

- |   |     |
|---|-----|
| 33. ambos público e instituições particulares | (2) |
| 34. público e privado instituindo             | (3) |
| 35. público e privado instituto               | (2) |
| 36. instituições públicas e privada           | (5) |
| 37. ambos público e particular instituições   | (1) |
| 38. instituições público e privado            | (1) |

39. em escolas pública e privadas (2)

EDUCATIONAL POLICY

40. educação policial (1)  
41. (orientação) educacional (básica) e política (3)  
42. prudência educacional (1)  
43. censo educacional (1)  
44. educação política (4)  
45. educacional política (6)  
46. educação e política (2)  
47. política (de orientação básica e) educacional (3)  
48. política (básica de) educação (e orientação) (2)

HIGH-SCHOOL LEVEL

49. alta escola de nível (4)

FEDERAL SCHOOL SYSTEM

50. as federais escolas do sistema (2)  
51. o federal e escolar sistema (1)

THE NATIONAL EDUCATIONAL SYSTEM

52. o nacional e educacional sistema (2)  
53. a nacional educação do sistema (4)  
54. a educação nacional e o sistema (3)

A NEW UNIVERSITY TEACHING LAW

55. uma lei do novo ensino universitário (5)  
56. uma nova universidade de ensinamento de lei (2)  
57. uma nova universidade ensinando lei (1)



### THE COUNTRY'S UNIVERSITIES

58.	universidade estaduais	(1)
59.	os países dos universitários	(2)
60.	idades universitárias	(3)
61.	os países universitários	(1)
62.	INCOMPLETE	(2)

### ADMINISTRATIVE ACTIVITIES

63.	administração das atividades	(2)
64.	administrativas e atividades	(1)

### (RESEARCH AND) EXTENSION OBJECTIVES

65.	objetivos (da pesquisa e) extensão	(14)
66.	relação da duração do curso	(1)
67.	extensão objetiva	(6)
68.	extensão de objetivos	(15)
69.	(investigar e) estender os objetivos	(1)
70.	obtenção de objetivos	(1)
71.	prorrogação de objetivos	(1)
72.	extensão dos objetivados	(1)
73.	extensão e objetivos	(1)
74.	(pesquisa e) extensão objetivos	(8)

### UNIVERSITY ACADEMIC ACTIVITIES

75.	os acadêmicos universitários	(1)
76.	atividades na academia universitária	(2)
77.	academia de atividades universitárias	(3)
78.	atividades universitárias	(1)

- |     |                                     |     |
|-----|-------------------------------------|-----|
| 79. | atividades acadêmica universitária  | (2) |
| 80. | universidade de acadêmica atividade | (2) |

#### UNIVERSITY TEACHING METHODS

- |     |                                |     |
|-----|--------------------------------|-----|
| 81. | universidade ensinando métodos | (3) |
| 82. | universidade, ensino e métodos | (2) |

#### DEPARTMENT SYSTEM

- |     |                         |     |
|-----|-------------------------|-----|
| 83. | departamento e sistema  | (2) |
| 84. | departamento de sistema | (1) |

T2C - Both Groups

RACE AND HEREDITY

No of translations: 62

(Nursing Group: 38)

(Physics Group: 24)

#### SKIN COLOUR

- |    |                   |     |
|----|-------------------|-----|
| 1. | epiderme colorida | (2) |
| 2. | cor e pelo        | (1) |
| 3. | pele e cor        | (2) |
| 4. | pele de cor       | (3) |
| 5. | pele colorida     | (3) |

#### HAIR TYPE

- |    |                |     |
|----|----------------|-----|
| 6. | cabelo, tipo   | (2) |
| 7. | cabelo do tipo | (3) |
| 8. | cabelo         | (2) |

#### HEAD SHAPE

- 9. cabeça moldada (2)
- 10. cabeça e forma (2)
- 11. cabeça (2)

#### NEGROID RACES

- 12. negros e raças (2)
- 13. negrõide raças (1)
- 14. negros de raças (2)

#### THE INTERVENING SEMITIC PEOPLES

- 15. a intervenção semítica de povos (4)
- 16. os povos semíticos (30)
- 17. os povos semíticos sobreviventes (1)
- 18. a pessoas semetic (3)
- 19. intervendo (ou circundando) pessoas (1)
- 20. a intervenção somática (5)

#### BIOLOGICAL ASSET

- 21. a biologia avalia (1)
- 22. afirma a biologia (2)
- 23. propriedade pessoal (3)
- 24. (hã) avaliação biológica (6)
- 25. em biologia insistem (1)
- 26. a biologia insiste (1)

#### HUMAN SPECIES

- 27. humana em espécies (1)

### CHEMICAL-MICROSCOPIC METHODS

- |                                      |      |
|--------------------------------------|------|
| 28. microscópio químico              | (3)  |
| 29. métodos microscópicos da química | (6)  |
| 30. métodos microscópicos-químicos   | (12) |

### SICKLE-CELL ANEMIA

- |                              |     |
|------------------------------|-----|
| 31. célula em forma de foice | (1) |
| 32. anemia aguda             | (3) |
| 33. célula anêmica           | (6) |
| 34. foice-célula de anemia   | (1) |
| 35. sickle-célula anêmica    | (2) |
| 36. sickle-célula anemia     | (2) |
| 37. "sickle-cell" anemia     | (2) |

### HEREDITARY FORM

- |                          |     |
|--------------------------|-----|
| 38. hereditário em forma | (2) |
|--------------------------|-----|

### RH-NEGATIVE FACTORS

- |                           |     |
|---------------------------|-----|
| 39. Rh-negativo, fatores  | (2) |
| 40. Rh-negativo e fatores | (1) |

### THE TALL, THIN SHAPE (OF SOME TRIBES)

- |                                    |     |
|------------------------------------|-----|
| 41. os altos, os magros e forma    | (2) |
| 42. toda forma magra               | (1) |
| 43. o alto, magra forma            | (3) |
| 44. o alto, delgada forma          | (3) |
| 45. o alto, forma fina             | (5) |
| 46. o elevado, aspectos de magreza | (1) |

47. a altura forma magra (2)

LARGER BODY SURFACES

48. corpo largo superficialmente (1)

49. corpo mais largo de superfície (2)

50. o mais largo corpo de superfície (2)

51. superfície do corpo maior (4)

52. corpo maior e superfície (1)

53. a maior superfície do corpo (2)

54. maior corpo da superfície (5)

55. corpo e faces grandes (1)

56. largamente alguma superfície (1)

57. em grande escala a superfície do corpo (3)

EFFICIENT HEAT LOSS

58. eficiente calor e perda (1)

59. eficiência do calor perdido (1)

SHORT HEAT PRESERVING PHYSIQUES

60. corpos muito resistentes ao calor (1)

61. pequeno para a conservação do calor (2)

62. pequenos para o calor preservar (2)

63. (tendendo a) preservar os corpos fisicamente (1)

64. pequenos, preservando o físico (1)

65. pequenos, preservando o calor (1)

66. pouco calor os físicos preservam (1)

67. pequenos, conservando os calores físicos (2)

68. curtos, conservando o calor físico (2)

69. pequenos que preserva calor físico. (6)

70. físicos baixo e preserva calor (4)

ENVIRONMENTAL FORCES

71. ambiental forças (1)

2.1.2. All types of errors in nominal groups in the texts  
administered to the Physics Group

TTP - Text number 1 - ELECTRIC MOTORS

Nº of translations: 24

THE ELECTRIC MOTOR

1. a eletricidade do motor (2)

(ONE OF) THE MOST HELPFUL MODERN INVENTIONS

2. uma ajuda da invenção moderna (1)  
3. uma das mais modernas (1)  
4. uma das invenções modernas mais útil (1)  
5. uma das invenções moderna (1)  
6. uma das mais útil e moderna invenções (2)  
7. uma das mais útil moderna invenções (1)  
8. uma das mais úteis e moderna invenção (1)  
9. uma das mais útil invenção modernas (1)  
10. uma das mais úteis invenções moderna (1)  
11. uma das mais útil invenções moderna (1)  
12. uma das mais valiosa invenções moderna (1)  
13. a maior ajuda das invenções modernas (1)

ELECTRIC TRAINS

14. eletricidade de trens (2)

#### EVERYDAY THINGS

15. todo dia coisas (8)

#### FOOD MIXERS

16. comida, misturadores (2)

#### VACCUM CLEANERS

17. vácuo limpador (2)

#### ELECTRIC RAZORS

18. eletricidade de barbeadores (2)

#### STEAM ENGINES

19. os engenhos de vapor (1)  
20. motores a vapor (1)  
21. máquinas (1)  
22. vapores ou fumaça em máquinas (de petróleo) (1)  
23. vapor e máquinas (2)

#### PETROL ENGINES

24. máquinas a gasolina (21)  
25. máquina a óleo (1)  
26. máquina a petróleo (1)  
27. petróleo de máquinas (1)

#### FEW MOVING PARTS

28. movimentos (1)  
29. mudanças (4)  
30. movimenta (poucas) partes (1)

31. movimentando algumas partes (3)  
32. (poucas) partes mōvel (1)  
33. pouco movimento de partes (2)

ELECTRIC MOTOR (2nd time)

34. a eletricidade do motor (2)

ELECTRIC SUPPLY LINE

35. eletricidade de suprir linha (2)

ELECTRIC MOTOR (3rd time)

36. eletricidade de motor (2)

MOTOR CYCLE

37. motor, ciclo (1)  
38. motor de ciclo (1)

POWER POINT

39. força de ponto (2)

ELECTRIC MOTOR (4th time)

40. a eletricidade do motor (2)

(FOR) ALL THESE MACHINES (THE ELECTRIC MOTOR CAN BE USED)

41. (para) tudo essas máquinas (2)  
42. (em) tudo aquelas máquinas de motor elētrico (2)  
43. todas essas máquinas elētricas (2)  
44. desse modo os motores elētricos (2)

T2P - Text number 2 - CORROSION

Nº of translations: 24

THE SLOW, GRADUAL ATTACK



- |                                      |     |
|--------------------------------------|-----|
| 45. a apresentação gradual da junção | (1) |
| 46. vagaroso e gradual, ataca        | (1) |
| 47. lenta e gradual ataque           | (1) |
| 48. vagaroso, ataca gradual          | (3) |
| 49. o lento, gradualmente atacado    | (3) |
| 50. o mais lento graduado ataque     | (1) |
| 51. o lento e gradual atacado        | (2) |

#### THE BEST KNOWN EXAMPLE

- |                                   |     |
|-----------------------------------|-----|
| 52. o melhor de conhecido exemplo | (1) |
|-----------------------------------|-----|

#### ORDINARY IRON

- |                        |     |
|------------------------|-----|
| 53. ordinário de ferro | (2) |
|------------------------|-----|

#### (THE PROCESS THAT ATTACK) EXPOSED METALS

- |   |     |
|---|-----|
| 54. (de ataques que) explodem metais    | (1) |
| 55. (desta atacada) exposição de metais | (5) |
| 56. (deste ataque) exposto aos metais   | (4) |
| 57. (que ataca) expondo os metais       | (1) |
| 58. (deste ataque) mostrado nos metais  | (1) |
| 59. (deste ataque para) expor metais    | (1) |

#### SULPHUR COMPOUNDS

- |                         |     |
|-------------------------|-----|
| 60. enxofre e compostos | (1) |
|-------------------------|-----|

#### THE 'NOBLE' METALS

- |                         |     |
|-------------------------|-----|
| 61. o nobre metais      | (1) |
| 62. a nobreza de metais | (1) |

T3P - Text number 3 - MATERIALS

Nº of translations: 24

UNIQUE PROPERTIES

- |     |                     |     |
|-----|---------------------|-----|
| 63. | uma propriedade s̄o | (6) |
| 64. | uma s̄o propriedade | (4) |
| 65. | INCOMPLETE          | (1) |

INCREASING QUANTITIES

- |     |                             |     |
|-----|-----------------------------|-----|
| 66. | aumento de quantidade       | (2) |
| 67. | quantidades aumentando      | (6) |
| 68. | (para) aumentar quantidades | (1) |

SPECIFIC MATERIALS

- |     |                               |     |
|-----|-------------------------------|-----|
| 69. | particularidades de materiais | (1) |
| 70. | particulares de materiais     | (7) |

PARTICULAR GRADES

- |     |   |     |
|-----|---|-----|
| 71. | graus de particularidades                   | (2) |
| 72. | classificações particulares                 | (7) |
| 73. | determinado grau                            | (1) |
| 74. | uma s̄rie (destes) particulares (materiais) | (3) |
| 75. | graus particulares                          | (1) |
| 76. | uma s̄rie particular                        | (2) |
| 77. | (em) grau particular                        | (2) |
| 78. | particular n̄veis                           | (3) |
| 79. | particular e graus                          | (1) |
| 80. | particularidade dos graus                   | (1) |

SPECIAL KIND

- |     |                  |     |
|-----|------------------|-----|
| 81. | especial do tipo | (1) |
|-----|------------------|-----|

RELATIVE CHEAPNESS

- |     |                                |     |
|-----|--------------------------------|-----|
| 82. | relativa vulgaridade           | (1) |
| 83. | relatividade vulgar            | (1) |
| 84. | relativa barateamento          | (2) |
| 85. | (jornais) baratos (ē) relativo | (2) |
| 86. | relatividade do barato         | (2) |

A WIDER RANGE (OF NEW AND BETTER MATERIALS)

- |     |                            |     |
|-----|----------------------------|-----|
| 87. | um largo alcance           | (4) |
| 88. | um longo alcance           | (3) |
| 89. | uma classificação ampla    | (2) |
| 90. | uma classificação ampliada | (5) |
| 91. | um aumento                 | (2) |
| 92. | uma grande área            | (2) |
| 93. | a mais larga das áreas     | (1) |

T4P - Text number 4 - CONCRETE

Nº of translations: 24

STRUCTURAL STEEL (OR REINFORCED CONCRETE)

- |     |                                      |     |
|-----|--------------------------------------|-----|
| 94. | estrutura de aço                     | (2) |
| 95. | estrutura de fundição                | (2) |
| 96. | armação de aço (reforçado)           | (7) |
| 97. | estrutura de aço (reforçada)         | (1) |
| 98. | estrutura de aço (de cimento armado) | (1) |
| 99. | estrutura rígida                     | (1) |

REINFORCED CONCRETE

100. reforçado com concreto (8)  
101. reforço de concreto (1)

ROTATING CYLINDER

102. cilindro girando (3)  
103. rotação de cilindro (2)

VERY STRONG CONCRETE (IS NEEDED)

104. muito concreto (1)  
105. muitos concretos (1)  
106. muito forte e carente o concreto (10)

METAL BARS

107. metal de barras (2)  
108. metal e barras (2)

AIR BUBBLES

109. ar das bolhas (6)  
110. ar e bolhas (1)

(THESE) METAL REINFORCEMENTS

111. metais reforçados (3)  
112. metais de reforço (2)  
113. o metal reforçosamente (1)  
114. metal reforços (1)

(MUCH OF CONCRETE SIMPLY HOLDS THE STEEL REINFORCEMENT  
IN POSITION) THE STEEL REINFORCEMENT

115. aço reforça (9)  
116. aço reforçando (2)

117.	o aço (em posição de) reforço	(1)
118.	o aço e o reforço	(1)
119.	o aço reforçado	(1)
120.	a rigidez do reforço	(1)

#### EXTERNAL LOAD

121.	carga external	(6)
122.	carga útil	(1)
123.	external de carga	(2)

#### (IN) TWO WAYS

124.	duas passagens	(10)
125.	duas etapas	(1)

#### STRETCHED STEEL WIRES

126.	aço e arame dilatados	(7)
127.	arame esticado em torno do aço	(1)
128.	arame de metal estirado	(1)
129.	fios de aço	(1)
130.	fios de arame esticados	(5)
131.	esticado arame de aço	(1)
132.	esticado o aço de arames	(2)

#### STEEL WIRES

133.	aço de arame	(1)
134.	aço e arames	(2)

#### PRE-FABRICATED UNITS

135.	(um número) pré-fabricado de unidades	(8)
136.	pré-fabricação única	(1)
137.	(um número) prefabricados de unidades	(1)

138. (uma quantidade) pré-fabricadas (1)  
 139. pré-fabricados e unidades (1)

'BUILT IN' STRESS

140. 'construído em' pressão (10)  
 141. 'construído em' tensão (1)  
 142. construção em pressão (1)  
 143. pressão em construção (4)  
 144. construção em stress (2)  
 145. INCOMPLETE (3)

T5P - Text number 5 - CAN LIFE EXIST ON THE PLANETS?

Nº of translations: 24

ASTRONOMICAL BODY

146. substância astronômica (1)  
 147. grupo astronômico (1)  
 148. marca de astronomia (1)  
 149. astronauta do corpo (2)  
 150. corpo astrônomo (1)  
 151. (tipo) astronômico de substância (1)  
 152. (tipo) astronômico na parte principal (1)  
 153. astronomicamente o modelo do corpo (1)  
 154. astrônomo corpo (1)  
 155. astronomia corporal (1)  
 156. astronomia (1)

REQUISITE CONDITIONS

157. condições dos requisitos (1)  
 158. condições dos requisitados (8)

159.	o requisito de condições	(7)
160.	os requisitos condicionados	(1)
161.	os requisitos e condições	(1)
162.	requerida a condição	(1)
163.	requisitam condições	(1)
164.	planos de condições	(1)
165.	condições	(1)
166.	os requisitos, condições	(2)

#### THE AT ONE TIME WIDELY ACCEPTED VIEW

167.	(registrar) largamente aquelas paisagens reconhecidas	(2)
168.	(rejeitar) larga aquelas paisagens reconhecidas	(1)
169.	(requisitar) algum tempo amplamente aceito a examinar	(4)
170.	(separar) um tempo longamente aprovado uma vista	(1)
171.	(rejeitar) uma opinião amplamente	(1)
172.	(por de lado) o modo selvagem e aceitar numa visão	(1)
173.	(anular) a definição	(1)
174.	(rejeitar) amplamente na hora aceita a vista	(1)
175.	(discordar) em um tempo amplamente aceitável o visto	(1)
176.	(descartar) em comum acordo numa opinião aceita no tempo	(1)
177.	(livrar) dos problemas em um tempo largo aceitando em vista	(1)
178.	(descartar) em um tempo amplamente concebido uma amostra	(1)
179.	(dispor) de um certo tempo a aprovar opiniões	(1)
180.	(separar) de vista	(1)
181.	(rejeitar) em um tempo ideal	(1)

182. (parar) no tempo aprovado numa vida (1)
183. (discordar) do conceito que era em outro tempo  
muito visto (1)
184. (descartar-se) de um tempo extremamente aceitado  
visto (que) (1)
185. (discordar) que uma vez aceita a vaga visão (que) (1)
186. (descartar) que num tempo remoto admitiu-se pers-  
pectivas (1)

#### THE WHOLE UNIVERSE

187. o universo mais completo (2)
188. (atē que) um completo (gera) o universo (1)
189. (atē) o todo universo (3)
190. o conjunto universo (2)

#### PLANETARY SYSTEMS

191. planetários sistemático (3)
192. os planetas do sistema (1)

T6P - Text number 6 - CAN LIFE EXIST ON THE PLANETS? (II)

Nº of translations: 24

#### THE NORMAL EVENT

193. o normal eventual (2)

#### INANIMATE MATTER

194. inanimado da matéria (2)

#### (IN) DUE COURSE

195. obrigação do curso (1)
196. própria corrente (2)



- 197. oportunidade da ocasião (4)
- 198. o curso do dever (1)

#### PHYSICAL ENVIRONMENT

- 199. o físico ambiental (1)
- 200. a física ambiental (1)

#### DEFINITE KNOWLEDGE

- 201. definição do conhecimento (1)

### T7P - Text number 7 - THE QUANTUM THEORY OF RADIATION (I)

Nº of translations: 24

#### NO NOTION (OF NATURAL UNITS)

- 202. mudanças (de unidades naturais) (1)
- 203. movimento (de unidade natural) (6)
- 204. deslocamento (de unidades naturais) (1)

#### NATURAL UNITS (OF RADIANT ENERGY)

- 205. (movimento) natural de uniões (4)
- 206. naturais (movimentos) de unidades (3)
- 207. (mudança) natural de uniões (4)
- 208. junção natural (1)
- 209. (energia radiante de) uma unidade natural (9)
- 210. (noção) natural (de energia radiante) (1)
- 211. natureza de uniões (1)

#### THE VIOLET AND ULTRA-VIOLET END (OF THE SPECTRUM)

- 212. (energia) violeta e ultra-violeta (do espectro) (9)

213.	(na) violeta e ultra-violeta final (do espectro)	(8)
214.	violetas e ultra-violetas final (do espectro)	(1)
215.	a violeta, a ultra-violeta e o fim (de aspectos)	(1)
216.	a violeta, a ultra-violeta, fim (de aspectos)	(4)
217.	(no fim do espectro) violeta e ultra-violeta	(1)

#### A LUMINOUS ATOM

218.	a luminosidade atômica	(2)
219.	a luz do átomo	(1)

#### ANY MINUTE PIECE

220.	pedaço de minuto	(3)
221.	minuto em pedaço	(2)
222.	minuto e pedaço	(1)

#### ELECTRIC CHARGE

223.	acusação elétrica	(3)
224.	contribuição elétrica	(3)
225.	eletricidade carregada	(2)

#### THE ONLY OBJECT (OF SOMETIMES USING THE NEW TERM)

226.	o único objeto	(10)
227.	alguns objetos	(1)
228.	os objetos	(1)
229.	o sō objeto	(4)
230.	INCOMPLETE	(8)

T8P - Text number 8 - THE QUANTUM THEORY OF RADIATION (II)

Nº of translations: 24

(THE QUANTUM OF) RADIANT ENERGY

- 231. a energia quântica radiante (4)
- 232. a energia quântica de radiação (2)
- 223. o quanta (2)

EVERY DIFFERENT WAVE-LENGTH

- 234. cada onda modular (2)
- 235. diferente de todo comprimento de onda (3)
- 236. todos os comprimentos de ondas (de radiação)  
diferente (3)
- 237. diferenciar por qualquer comprimento de onda (1)
- 238. todas as ondas diferentes de comprimento (1)
- 239. sempre diferente e oscilante (2)
- 240. diferente para toda duração (1)
- 241. toda diferente onda de comprimento (1)
- 242. toda diferente onda-extensão (1)
- 243. cada diferente onda-comprimento (1)

EXTREME VISIBLE RED RADIATION

- 244. extrema visibilidade para o vermelho radiação (1)
- 245. extrema visibilidade de vermelha radiação (4)
- 246. visibilidade encarnada extrema de radiação (1)
- 247. extrema radiação vermelha visível (1)
- 248. extrema radiação de vermelho visível (1)
- 249. radiação vermelha, extrema e visível (1)
- 250. radiação vermelha extremamente visível (1)

251.	uma radiação visível extremamente vermelha	(1)
252.	radiação vermelha extrema	(2)
253.	radiação vermelha de extrema visibilidade	(1)
254.	radiação vermelha	(1)
255.	o último extremo da radiação vermelha	(1)
256.	extremo vermelho e visível	(1)
257.	visível extremo rubro de radiação	(1)
258.	extrema de visível vermelha radiação	(2)
259.	extrema visível de vermelho radiação	(1)
260.	extremo visível vermelha radiação	(1)
261.	vermelho extremo	(1)
262.	(energia quântica) extremamente visível de radiação vermelha	(1)

#### A GIVEN SPECIES (OF RADIATION IS FOUND)

263.	(para) dar uma espécie	(3)
264.	concedido (a radiações) especiais	(1)
265.	espécies (de radiação encontrada)	(2)
266.	espécie (encontradas)	(2)

#### PLANCK'S UNIVERSAL CONSTANT

267.	constantemente (chamado de) universal de Plank	(1)
268.	tábua universal constante	(1)
269.	prancha universal constante	(3)
270.	planck's universal constante	(6)

#### PLANCK'S CONSTANT (ENTERS INTO EVERY ASPECT)

271.	tábua constante	(1)
272.	prancha constante	(3)

273. Planck's (ē a entrada) constante (1)  
 274. Planck's constante (5)

(IN THE NATURE OF) PULSATING PROPERTIES

275. (de ter de)pulsar propriedades (2)  
 276. (de) propriedades pulsando (3)  
 277. (de) propriedades de pulsar (2)  
 278. a propriedade de pulsação (natural) (2)  
 279. a propriedade de vibração (natural) (5)  
 280. oscilação de propriedades (1)  
 281. (de) pulsar de propriedades (1)  
 282. vibração propriedade (1)  
 283. propriedade (1)  
 284. (com) propriedades pulsãtil (2)  
 285. pulsação propriedade (1)

THE DOUBLE ASPECT

286. (para)dobrar o aspecto (4)  
 287. (do) dobro (para cobrir) o aspecto (2)  
 288. (do) dobro (para cobrir com feltro) o aspecto (1)  
 289. (ele precisa de feltro para a partícula) dobrar o  
 aspecto (periódico) (1)

T9P - Text number 9 - PARTICLES OR WAVES? (I)

Nº of translations: 24

STRAIGHT EDGES

290. a reta de bordas (2)  
 291. régua de pedreiro (2)

292. estranha linha (1)

A RAPIDLY MOVING PARTICLE (OF MATTER)

293. um rápido movimento de partícula (3)

294. uma ligeira mudança de partícula (13)

295. uma ligeiramente móvel partícula (2)

296. partícula (de material) (1)

EARLY SCIENTISTS

297. os cientistas precavidos (11)

298. os cientistas adiantados (2)

299. os principais cientistas (1)

300. o cientista prematuro (1)

301. antes cientistas (3)

302. cedo cientistas (1)

CONSTANT RATIO

303. uma constante proporcional (5)

304. uma constante de rádio (1)

305. uma propagação constante (7)

T10P - Text number 10 - PARTICLES OR WAVES? (II)

Nº of translations: 24

THIS LATTER PART

306. sua parte superior (8)

307. esta parte mais tarde (5)

308. esta mais tardia parte (1)

ALTERNATE FITS

309. alternativas de períodos (3)

310. alternando períodos (1)

THE NEXT INSTANT (THE GATES WERE SHUT)

311. neste instante (13)

T11P - Text number 11 - THE THEORY OF CONTINUOUS CREATION

Nº of translations: 24

THIS BIG BANG IDEA

312. esta grande idéia de ruído (2)

313. esta grande golpeada idéia (1)

314. esta grande porção de idéias (1)

315. esta idéia de grande expansão (8)

316. esta grande explosão de idéia (1)

DETAILED EXAMINATION

317. (de ter) detalhado a examinação (8)

318. detalhe de examinação (1)

DIFFUSE BACKGROUND MATERIAL

319. um material difuso no último plano (1)

320. (para fora) a difusão de experiência material (3)

321. material (fora) e espalhado no segundo plano (4)

322. (para) difundir material (1)

T12P - Text number 12 - ATOMIC RADIATION AND LIFE

Nº of translations: 24

(A NUMBER OF) EXTREMELY DELICATE METHODS

323. (um número) extremamente delicado de métodos (2)

324. métodos extremos e delicados (13)

325. extremos delicados e métodos (1)

DECAY PRODUCTS

326. resultados produzidos (3)

327. decadência produtiva (2)

328. declínio do produto (1)

329. declínio da produção (2)

330. resultado degenerado (1)

2.1.3. All types of errors in nominal groups in the texts  
administered to Nursing Group

T1N - Text number 1 - THE NERVOUS SYSTEM

Nº of translations: 38

(A NUMBER OF) SPECIAL NERVES

1. (um grupo) especial de nervos (1)

2. (um número) específico de nervos (5)

3. (um grupo) de especial nervos (2)

A SHARP PICTURE (OF THE OUTER WORLD)

4. as imagens clara (1)

5. rápido a imagem (1)

6. distinta no quadro (2)

7. afiada no quadro (1)

THE OUTER WORLD

8. fora do olho (9)

9. dentro do olho (1)



- |     |             |     |
|-----|-------------|-----|
| 10. | do mundo    | (1) |
| 11. | das células | (2) |

THE OUTER EAR

- |     |                           |      |
|-----|---------------------------|------|
| 12. | a parte de fora do ouvido | (13) |
| 13. | o exterior do ouvido      | (5)  |
| 14. | o externo do ouvido       | (1)  |
| 15. | a outra orelha            | (2)  |
| 16. | a orelha                  | (1)  |
| 17. | o ouvido de fora          | (1)  |

THE THIN, FLEXIBLE DRUM

- |     |                             |     |
|-----|-----------------------------|-----|
| 18. | a delgada flexão do tímpano | (6) |
| 19. | o magro, flexível tímpano   | (1) |
| 20. | o fino flexível             | (3) |
| 21. | INCOMPLETE                  | (2) |

THE INNER EAR

- |     |                             |      |
|-----|-----------------------------|------|
| 22. | a parte de dentro do ouvido | (15) |
| 23. | o interior do ouvido        | (10) |
| 24. | o interior da orelha        | (3)  |
| 25. | o anterior do ouvido        | (1)  |

A SPIRAL SHELL-LIKE STRUCTURE

- |     |  |     |
|-----|--|-----|
| 26. | a estrutura especial em forma de concha      | (3) |
| 27. | uma especial de estrutura em forma de concha | (6) |
| 28. | uma espécie estrutural em forma de concha    | (1) |
| 29. | um espiral e uma estrutura como concha       | (1) |
| 30. | espiral e uma estrutura como concha          | (1) |

THREE TINY DOUGHNUT-SHAPED HOLLOW TUBES

- |     |  |     |
|-----|--|-----|
| 31. | três tubos com pequenas cavidades agudas e ocas    | (3) |
| 32. | três pequenas cavidades de tubos                   | (1) |
| 33. | três pequeninos tubos de massa                     | (2) |
| 34. | três pequenas cavidades de massa em forma de tubos | (1) |
| 35. | três pequenas massas formada de ocos tubos         | (9) |
| 36. | três pequenas membranas ocas                       | (1) |
| 37. | três pequenos canais de tubos com aspectos finos   | (2) |
| 38. | três pequenos convexos tubos                       | (2) |
| 39. | três pequenas camadas                              | (1) |
| 40. | três pequenos sonho de modelo côncavo tubos        | (1) |

T2N - Text number 2 - LATEST IN HEALTH AND MEDICINE

Nº of translations:38

SOLID EVIDENCE

- |     |                    |     |
|-----|--------------------|-----|
| 41. | o sólido demonstra | (2) |
|-----|--------------------|-----|

AN INFECTIOUS VIRUS

- |     |                       |     |
|-----|-----------------------|-----|
| 42. | seres infecciosos     | (1) |
| 43. | uma infecção de virus | (3) |
| 44. | virus uma infecção    | (1) |

A RESULTANT DROP

- |     |                         |      |
|-----|-------------------------|------|
| 45. | um resultado em gotas   | (10) |
| 46. | o resultado             | (2)  |
| 47. | o resultado pingo       | (3)  |
| 48. | uma resultante denúncia | (2)  |
| 49. | um pingo resultante     | (2)  |
| 50. | o resultado da queda    | (1)  |

- 51. um resultado, diminuição (2)
- 52. gotas (brancas) (1)

#### WHITE BLOOD CELLS

- 53. com células (1)
- 54. células do sangue (8)
- 55. globos brancos (9)
- 56. globos branco (1)
- 57. sangue celular branco (1)
- 58. sangue (5)
- 59. células branca (3)
- 60. (gotas) brancas nas células do sangue (1)

#### VIRAL AGENT

- 61. agente (1)
- 62. o virulento intermediário (2)
- 63. agente virus (1)
- 64. agente visualmente (multiplicado...) (4)

#### (IN THE BRAINS OF) TEST ANIMALS

- 65. testes em animais (4)
- 66. experiência animais (2)
- 67. testes no animal (1)
- 68. teste de animais (1)
- 69. teste animais (2)

#### VIRUS INFECTION

- 70. infecção de virus (3)
- 71. virus infecção (10)
- 72. virus de infecção (3)
- 73. infecção virus (1)

74. virus contágio (2)

CERTAIN PATTERNS

75. certo o padrão (10)

76. o padrão certo (1)

77. certo padrões (2)

78. certos exemplos (4)

79. o certo padrão (7)

T3N - Text number 3 - THE LYMPH DRAINAGE SYSTEM

Nº of translations: 38

THE LYMPH DRAINAGE SYSTEM

80. a linfa é o sistema de drenagem (29)

81. a linfa drenagem do sistema (4)

82. o sistema circulatório linfático (2)

83. a linfa sistema de drenagem (1)

THE LYMPH DRAINAGE SYSTEM (2nd time)

84. o sistema linfático (32)

85. a linfa drena sistema (1)

86. a linfa drenagem do sistema (4)

87. a linfa da drenagem sistemática (1)

THE RIGHT COLON

88. colo reto (30)

89. direito do colo (1)

90. a direita de dois pontos (1)

91. colo (2)

92. certo colo (1)

### THE LEFT COLIC FLEXURE

93.	flexura da cônica esquerda	(24)
94.	lado esquerdo da flexura cônica	(1)
95.	flexura do cólico esquerdo	(2)
96.	esquerda cônica flexão	(1)
97.	flexiva da cônica esquerda	(4)

### THE MARGINAL LYMPH NODES

98.	a margem da linfa	(29)
99.	a margem do linfa nódulos	(2)
100.	o nódulo da linfa marginal	(1)
101.	o nō linfático	(1)
102.	a marginal linfa nódulos	(1)

### THE MARGINAL LYMPH NODES (second time)

103.	a margem dos nódulos da linfa	(21)
104.	a margem do nódulo linfático	(2)
105.	a margem da linfa nódulo	(6)
106.	as margens do nódulo da linfa	(4)
107.	o nódulo da linfa marginal	(1)
108.	o nō linfático	(1)
109.	a marginal linfa nódulos	(1)

### THE LYMPH NODE STATIONS

110.	as estações do nódulo linfático	(1)
111.	a transmissão do nódulo linfático	(1)
112.	os nódulos linfáticos	(4)
113.	o modelo da linfa	(3)
114.	o nódulo da linfa posto	(1)
115.	a linfa nódulo transmissor	(1)

116. a posição linfa nódulo (1)  
117. INCOMPLETE (1)

THE LYMPH NODE STATIONS (second time)

118. os nódulos da linfa (23)  
119. os nódulos linfáticos (10)  
120. as estações do nódulo linfático (1)  
121. a estação do nodo linfático (1)  
122. a estação do nō linfático (1)  
123. o linfa nō da estação (1)  
124. os linfático (1)

THE RIGHT AND TRANSVERSE COLON

125. o colo transverso do colo direito (2)  
126. o colo transversal direito (2)  
127. (o hilo linfático) da direita e colon transverso (3)  
128. (o hilo linfático) direito e o colo transverso (4)  
129. (o hilo linfático) da direita e transversal colo (1)  
130. colo transverso (1)  
131. colo certo e transverso (1)

THE MIDDLE COLIC ARTERY

132. artéria cônica (27)  
133. artéria (9)  
134. o meio da artéria cônica (2)

THE LEFT COLIC ARTERIES

135. artéria da cônica esquerda (32)  
136. esquerda da artéria cônica (1)  
137. o esquerdo cônica artérias (1)  
138. INCOMPLETE (2)

THE LEFT HALF (OF THE COLON)

139.	a metade do colo esquerdo	(31)
140.	a metade do colo	(1)
141.	o meio da esquerda (dos dois pontos)	(1)
142.	o pedaço esquerdo do colo	(1)
143.	o meio esquerdo do colo	(1)

THE NEXT EMPLACEMENTS

144.	o próximo emplacamento	(25)
145.	o próximo colocado	(1)
146.	localizada próximo	(1)

T4N - Text number 4 - ACUTE RESPIRATORY FAILURE

Nº of translations: 38

ALVEOLAR AIR

147.	os alvéolos	(2)
148.	o ar	(12)
149.	alveolar	(1)
150.	semblante alveolar	(1)

HIGH PARTIAL PRESSURE

151.	pressão parcial superior	(3)
152.	reflexão parcial alta	(1)
153.	depressão alta	(1)
154.	alto e parcial respiração	(1)

THE PATIENTS' NEEDS

155.	os pacientes necessariamente	(9)
156.	os pacientes necessários	(10)
157.	o paciente com necessidade	(2)

158.	necessidades	(5)
159.	as pacientes necessidades	(11)

#### ROOM AIR

160.	sala de ar	(11)
161.	ar poluído	(1)
162.	(no) aposento	(1)
163.	ar do meio	(1)
164.	sala ar	(1)
165.	INCOMPLETE	(1)

#### CHRONIC OBSTRUCTIVE LUNG DISEASE

166.	obstrução do pulmão enfermo	(2)
167.	a crônica obstrutiva	(16)
168.	a doença pulmonar obstrução crônica	(1)
169.	obstruído de doenças pulmonares crônicas	(1)
170.	a crônica obstrutiva do pulmão doente	(1)
171.	a pulmonar obstrutiva crônica	(1)
172.	a doença pulmonares obstrutiva crônicas	(1)
173.	crônica obstruída doença pulmonar	(1)

#### AN INTEGRATED FEEDBACK CONTROL SYSTEM

174.	um sistema restaurado	(11)
175.	um controle integrado do sistema de auto-regulação	(11)
176.	um auto-regulação do controle do sistema	(1)
177.	um integrado distema central	(2)
178.	um sistema integrado controlado pelo feedback	(1)
179.	um sistema de controle	(1)
180.	a integração controlada pelo sistema de auto-regulação	(1)



181. uma integrado feedback, controle e sistema (1)

UPPER AIRWAYS

182. lobo posterior (3)

183. lobo superior (1)

184. canal superior (10)

185. condutos nasais (2)

LOWER AIRWAYS (AND LUNGS)

186. lobo inferior (4)

187. canal inferior (3)

188. narinas (2)

189. canal baixo (1)

190. INCOMPLETE (1)

CONGESTIVE HEART FAILURE

191. insuficiência cardíaca congênita (1)

192. congestão deficiente do coração (8)

193. fracasso congestivo do coração (2)

194. congestão da falência cardíaca (1)

195. falta de congestão no coração (1)

196. congestão deficiente do coração (3)

197. congestão insuficiência cardíaca (1)

198. congestão cardíaca da deficiência (2)

T5N - Text number 5 - CYSTITIS

Nº of translations: 38

PROLONGED IRRITATION

199. prolongando irritação (6)

200. provocado por irritação (1)

- 201. prolongada (prostatite) (1)
- 202. (prostatite) prolongando irritação (2)

#### FOREIGN BODIES

- 203. exterior do corpo (7)
- 204. corpo estrangeiro (1)
- 205. estranha (irritação) no corpo (3)
- 206. estranhos dos corpos (1)
- 207. (irritações) estranhas nos corpos (2)

#### (PREVENTION OF) NORMAL BLADDER EMPTYING

- 208. esvaziamento da bexiga normal (2)
- 209. bexiga normal cheia de... (4)
- 210. bexiga normal esgotando (sobre...) (1)
- 211. bexiga normal esvaziada (por...) (1)
- 212. bexiga normal despejando (para...) (4)
- 213. desocupagem da bexiga normal (10)
- 214. bexiga normal (por) (5)
- 215. bexiga normal encostando (sobre) (2)
- 216. vácuo normal (1)
- 217. normalidade da bexiga vazia (1)
- 218. desocupagem da bexiga (1)
- 219. normal bexiga esvaziamento (próximo a) (2)

#### ASCENDING INFECTION

- 220. ascendendo infecção (4)
- 221. elevado infecção (5)
- 222. refluxo infectado (1)
- 223. infecção (1)

#### A DISEASED URETHRA

- 224. um doente de uretra (1)
- 225. doença uretra (1)

#### URETHRAL STRICTURE

- 226. canal uretral (12)
- 227. exame uretral (3)
- 228. contração uretral (7)
- 229. estrutura uretral (8)
- 230. observação uretral (1)
- 231. uretral estrutura (1)
- 232. uretral da estenose (1)

#### TISSUE RESISTANCE

- 233. tecido resistente (25)
- 234. tecidos (baixos) resistentes (3)

#### FOLLOWING MAJOR SURGICAL PROCEDURES

- 235. seguindo os procedimentos pós-operatórios em cirurgias grandes (1)
- 236. seguindo a maioria dos casos cirúrgicos (2)
- 237. seguindo o principal procedimento cirúrgico (5)
- 238. seguindo maior procedimento cirúrgico (4)
- 239. seguindo maior processo cirúrgico (3)
- 240. seguindo a operação cirúrgica (8)
- 241. o método principal seguindo a cirurgia (1)
- 242. o processo principal cirúrgico resultante (1)
- 243. segundo operação cirúrgica (5)
- 244. principal procedimento cirúrgico resultante (2)
- 245. principal procedente cirúrgico resultante (1)
- 246. seguindo o método principal a cirurgia (2)

247. seguinte maior cirúrgico conduta (1)

PROLONGED BED REST

248. (partos) prolongados e repouso na cama (2)

249. (parto e) prolongada camada de repouso (4)

250. prolonga repouso na cama (1)

LOWERED RESISTANCE

251. diminuiu a resistência (3)

252. baixa da resistência (1)

253. INCOMPLETE (1)

INADEQUATE BLADDER EMPTYING

254. incapacidade da bexiga seca (3)

255. inadequade bexiga seca (1)

256. a bexiga inadequadamente vazia (1)

257. a bexiga despejando (mais) inadequada (4)

258. a bexiga esvaziando (mais) insuficiente (3)

259. inadequada a desocupagem da bexiga (12)

260. a desocupagem da bexiga é (mais) inadequada (1)

261. (mais) inadequada esvaziando a bexiga (3)

T6N - Text number 6 - TREATMENT OF ACUTE RENAL FAILURE

Nº of translations: 38

ACUTE RENAL FAILURE

262. fracasso renal agudo (4)

263. a renal aguda fracassada (1)

264. o agudo da renal insuficiência (3)

TISSUE INJURY

265.	tecido ofendido	(3)
266.	tecido prejudicado	(11)
267.	tecido mal	(1)

#### PRESSOR AGENTS

268.	agentes presos	(1)
269.	agentes impressores	(3)
270.	agentes precursores	(1)
271.	agentes pressor	(16)
272.	agentes vasoconstritor	(3)
273.	pressão agentes	(1)
274.	agentes	(1)

#### MARKED OLIGURIA

275.	uma marcada alegoria	(2)
276.	caracterizada alegoria	(1)
277.	oligúria limitada	(1)
278.	o limite da oligúria	(2)
279.	(todavia a restauração da integridade circulatória é) marcada (e persistente)	(20)
280.	alegoria (a integridade respiratória) limita (persistindo)	(1)
281.	a oliguria	(1)

#### PRONOUNCED RENAL DAMAGE

282.	um enunciado de dano renal	(2)
283.	doença renal citada	(7)
284.	locutor renal danificado	(1)
285.	estrago renal determinado	(1)
286.	perda articulada renal	(3)

- 287. determinado estrago (1)
- 288. pronunciado renal dano (1)

#### MISMATCHED TRANSFUSION

- 289. transfusão malfeita (7)
- 290. administrar transfusão (18)
- 291. transfusão (de severidade) (1)
- 292. administração de transfusão (2)
- 293. transfusão de mã gestão (1)
- 294. transformação inadequada (1)
- 295. transfusão 'mismatched' (3)
- 296. transfusão (4)

#### SUBSEQUENT ACUTE TUBULAR NECROSIS

- 297. subsequente intensidade tubular aguda (7)
- 298. gravidade da necrose tubular aguda (1)
- 299. subsequente desgaste tubular aguda (1)
- 300. subsequente tubular aguda (12)
- 301. subsequente aguda tubular necrose (1)
- 302. necrose tubular (1)
- 303. grave subsequente tubular agudo (1)

T7N - Text number 7 - LIVER AND BILIARY TRACT

Nº of translations: 38

#### THE LARGEST SECRETING ORGAN

- 304. órgão de grande secreção (2)
- 305. o maior órgão secretando (3)
- 306. o mais largo e secreto órgão (3)
- 307. o mais longo e secreto órgão (1)
- 308. (o fígado é) secretado por um órgão (1)

309. o maior órgão de sensação (1)  
310. o maior órgão misterioso (1)

A MAJOR DEGREE (OF RESERVE FUNCTIONAL CAPACITY)

311. a principal função (8)  
312. a maior condição (3)  
313. uma posição principal (1)  
314. o principal decreto (1)  
315. uma área maior (1)  
316. o maior volume (1)  
317. um grande degrau (1)

RESERVE FUNCTIONAL CAPACITY

318. reserva de capacidade funcional (2)  
319. capacidade funcional reservatória (1)  
320. reserva funcional capacidade (3)  
321. reserva funcional (5)  
322. capacidade de reserva (3)  
323. reserva capacitária (1)

EXTRAORDINARY POWERS (OF REGENERATION)

324. energia extraordinária (13)  
325. extraordinariamente poderes (1)  
326. extraordinariamente de pouca (regeneração) (1)

ACCURATE INFORMATION

327. função exata (1)  
328. precisa informações (6)

(CORDS OF) LIVER CELLS

329. células biliares (1)

- |                        |     |
|------------------------|-----|
| 330. células da medula | (1) |
| 331. INCOMPLETE        | (2) |

THE OTHER END

- |   |     |
|---|-----|
| 332. o outro termina                    | (7) |
| 333. o fim dos outros                   | (1) |
| 334. a outra conclue                    | (2) |
| 335. outras extremidades (está fechada) | (1) |

T8N - Text number 8 - BRONCHITIS

Nº of translation: 38

A GENERAL ACUTE UPPER RESPIRATORY INFECTION

- |  |     |
|--|-----|
| 336. infecção respiratória superior em geral aguda           | (9) |
| 337. infecção aguda geral do aparelho respiratório superior  | (8) |
| 338. infecção aguda da via respiratória superior geral       | (1) |
| 339. infecção respiratória aguda superior                    | (1) |
| 340. (é parte) geral da infecção aguda respiratória superior | (2) |
| 341. (é parte) comum aguda superior da infecção respiratória | (1) |
| 342. comum aguda infecção respiratória superior              | (8) |
| 343. (a parte) superior da infecção respiratória             | (2) |
| 344. geral aguda superior respiratória infecção              | (1) |

THE COMMON COLD

- |                    |     |
|--------------------|-----|
| 345. do comum frio | (7) |
|--------------------|-----|

A PYOGENIC OR VIRUS INFECTION

- |                                  |     |
|----------------------------------|-----|
| 346. piogênica infecção do vírus | (2) |
|----------------------------------|-----|



347.	piogênica ou virus infeccioso	(1)
348.	virus infeccioso	(1)
349.	piogênico ou infecção virótica	(10)
350.	a pyogenic ou virus infeccioso	(11)
351.	piogênica ou infecção	(2)
352.	(de uma) pyogenic de virus infeccioso	(2)

#### TRACHEOBRONCHIAL TREE

353.	árvore genealógica traqueobronquite	(7)
354.	traqueotomia	(1)

#### PREDISPOSING OR CONTRIBUTORY FACTORS

355.	os fatores predispostos ou contributivos	(3)
356.	predispõem e contribuem com fatores	(3)
357.	predispondo ou as causas contribuindo	(1)
358.	predispondo ou contributivos fatores	(3)
359.	predispondo ou os elementos colaboradores	(8)
360.	predispondo ou fatores contributários	(1)
361.	predisposta ou responsável fatores	(1)
362.	fatores que predispõe e contribui	(1)
363.	predispondo ou contributário (estão...)	(1)

#### CHRONIC PULMONARY OR CARDIAC DISEASE

364.	doença pulmonar cardíaca e crônica	(1)
365.	crônica pulmonar ou cardíaca doença	(12)
366.	pulmonar crônica ou doença cardíaca	(2)
367.	crônico pulmonar do doente cardíaco	(2)
368.	doença cardíaca	(1)

#### RECURRING ATTACKS

369.	ocorrendo ataques	(1)
------	-------------------	-----

- 370. recorrendo ataques (4)
- 371. voltando ataques (1)
- 372. ataques recorrente (4)

#### ACUTE BRONCHIAL IRRITATION

- 373. bronquial aguda causa irritação (1)
- 374. bronquial aguda irrita (3)
- 375. bronquial aguda irritações (1)
- 376. bronquial aguda irritação (25)

#### T9N - Text number 9 - HABITUAL ABORTION

Nº of translations: 38

#### A MORE COMPREHENSIVE EVALUATION

- 377. a evolução mais compreensiva (7)
- 378. a mais compreensível avaliação (2)
- 379. a mais compreensiva avaliação (4)
- 380. uma maior compreensão avaliativa (1)
- 381. uma maior avaliação compreensiva (14)
- 382. um estudo mais compreensivo (4)

#### SYSTEMIC, ENDOCRINE OR CYTOGENETIC FACTORS

- 383. (para excluir) sistematicamente fatores endócrinos e citogenéticos (7)
- 384. (controle) sistemático (exterior) (4)
- 385. (o domínio) sistemático endócrino (1)
- 386. (para excluir) sistematicamente, endócrina e geneticamente (1)
- 387. (ausente regra) sistemática (15)
- 388. (saída do) sistema endócrino ou citogenético (2)

- |      |  |     |
|------|--|-----|
| 389. | (dois) sistemas (de rejeição)                | (1) |
| 390. | (lei regulamentar) sistemático               | (1) |
| 391. | sistema endócrino                            | (2) |
| 392. | sistêmico, endócrino ou citogenético fatores | (1) |

#### LUTEAL PHASE

- |      |                 |     |
|------|-----------------|-----|
| 393. | fase luteal     | (8) |
| 394. | fase letal      | (1) |
| 395. | luteal, fase de | (2) |
| 396. | fase de luta    | (2) |
| 397. | INCOMPLETE      | (1) |

#### SEPTATE OR BICORNUATE UNICOLLIS UTERI

- |      |                                |      |
|------|--------------------------------|------|
| 398. | bicórneos fora do colo uterino | (1)  |
| 399. | bicarbonato existente no útero | (1)  |
| 400. | útero do colo                  | (1)  |
| 401. | único colo bicorne             | (1)  |
| 402. | INCOMPLETE                     | (21) |

#### THE DOUBLE OR DIDELPHIC UTERUS

- |      |                                      |     |
|------|--------------------------------------|-----|
| 403. | a duplicidade ou útero didélfico     | (7) |
| 404. | a duplicidade ou outras deficiências | (1) |
| 405. | a duplicidade ou úteros              | (1) |
| 406. | o dobro do útero                     | (8) |
| 407. | a duplicidade do útero               | (5) |
| 408. | o dobro ou didélfico úteros          | (3) |
| 409. | o duplo ou úteros                    | (1) |

#### A FIXED RETRODISPLACED UTERUS

- |      |  |     |
|------|--|-----|
| 410. | um determinado resto de placenta uterina | (2) |
|------|--|-----|

411.	a fixação retrodeslocada do útero	(5)
412.	um agente predisposto fixado no útero	(1)
413.	um útero retrocolocado fixamente	(1)
414.	a firme gravidez no útero	(1)
415.	uma fixa retrodisplacenta do útero	(1)
416.	um fixo no útero	(1)
417.	um fixado no útero	(1)
418.	fixa no útero	(1)
419.	fixo no útero	(1)

#### AN OLD HEALED INFLAMMATORY PROCESS

420.	um antigo processo de cura inflamatória	(16)
421.	o processo inflamatório	(9)
422.	o processo velho de inflamatório cicatrizante	(1)
423.	um velho curado de inflamatório processo	(2)

#### SUBMUCOUS FIBROIDS

424.	o submuco fibroso	(1)
425.	submucos fibrosas	(2)
426.	submucos fibrados	(2)
427.	submuco fibróide	(1)
428.	submucos fibróides	(13)
429.	fibroso de submucos	(1)
430.	fibras de submucos	(3)
431.	o fibrosamento da submucosa	(5)
432.	submucosa fibróides	(3)

#### A SILENT OR SYMPTOMATIC CAUSE

433.	um silêncio causa	(3)
434.	uma calma ou sintoma de causa	(1)

435. uma causa lenta (1)

TION - Text number 10 - PLACENTA PREVIA

Nº of translations: 38

THE THIRD TRIMESTER

436. um terço do trimestre (14)

437. terceiro mês (2)

EARLY PREGNANCY

438. próxima gravidez (7)

439. gravidez prematura (20)

440. gravidez precoce (3)

441. gravidez cedo (2)

EARLY ABORTION

442. próximo aborto (7)

443. aborto prematuro (22)

444. aborto precoce (3)

445. aborto cedo (4)

THE LOWER UTERINE SEGMENT

446. embaixo do segmento uterino (2)

447. abaixo do segmento uterino (4)

448. cavidade uterina (1)

449. segmento uterino (4)

THE INTERNAL CERVICAL OS

450. a interna cervical (16)

451. os cervicais internos (1)

452. o cervical interna (12)

453. os cervical interna (2)

- 454. a interna cervical a abertura (1)
- 455. INCOMPLETE (2)

#### ADVANCING MATERNAL AGE

- 456. o progresso maternal de idade (2)
- 457. o maternal progresso do século (1)
- 458. o avanço maternal age (4)
- 459. avanço maternal (2)
- 460. as ações maternas (1)
- 461. período maternal (2)
- 462. avançando a era maternal (12)
- 463. adiantando as ações maternas (2)
- 464. o avançamento maternal da idade (1)

#### INCREASING PARITY

- 465. crescimento da igualdade (2)
- 466. crescente semelhança (3)
- 467. aumento de paridade (2)
- 468. aumento (da predisposição) (2)
- 469. aumenta a paridade (1)
- 470. aumentando a paridade (5)
- 471. aumentando ambos (1)
- 472. igualmente (2)
- 473. aumentando (14)
- 474. INCOMPLETE (4)

#### UNFAVORABLE UTERINE ENVIRONMENT

- 475. desfavorável (ã concepção) (1)
- 476. desfavorável (concepção) (1)
- 477. uterina desfavorável (9)

- |      |  |     |
|------|--|-----|
| 478. | desfavorável uterino                   | (1) |
| 479. | ambiente uterino infavorável           | (2) |
| 480. | uterina desfavorável condição orgânica | (1) |

T11N - Text number 11 - PYELONEPHRITIS

Nº of translations: 38

DISEASED AREAS (ALTERNATING WITH HEALTHY OR MUCH LESS  
DISEASED AREAS)

- |      |                        |      |
|------|------------------------|------|
| 481. | área sadia (ou doente) | (12) |
| 482. | áreas (alternativas)   | (1)  |

HEALTHY OR MUCH LESS DISEASED AREAS

- |      |                            |      |
|------|----------------------------|------|
| 483. | área muito inferior        | (12) |
| 484. | muito poucas áreas doentes | (7)  |
| 485. | muito menos áreas doentias | (10) |

RENAL BIOPSY

- |      |           |     |
|------|-----------|-----|
| 486. | biofísica | (4) |
|------|-----------|-----|

T12N - Text number 12 - ACUTE RENAL FAILURE

Nº of translations: 38

(EVIDENCE OF) GROSS CHEMICAL DERANGEMENT

- |      |   |      |
|------|---|------|
| 487. | grosseira desordem química                        | (2)  |
| 488. | transtorno de grandes produtos                    | (11) |
| 489. | volumoso desarranjo químico                       | (10) |
| 490. | grosso desarranjo químico                         | (3)  |
| 491. | grande transformação química                      | (1)  |
| 492. | rude (evidência) desordenada de produtos químicos | (4)  |
| 493. | rude química de desarranjo                        | (2)  |

494. (demonstração) de produtos químicos (2)  
495. (prova) rude de substância química desarranjada (1)

THE BEST ATTEMPTS

496. ótima tentativa (11)  
497. a tentativa boa (1)  
498. a melhor das tentativas (1)  
499. tentativa (2)  
500. uma melhor tentativa (3)

THE RELATIVELY SUDDEN INABILITY (OF THE KIDNEYS)

501. a relatividade súbita da inabilidade (2)  
502. a relativa inabilidade (1)  
503. a relativa incapacidade (2)  
504. relatividade súbita incapacitada (4)  
505. relatividade repentina inabilitada (7)  
506. o relativo súbito de inabilidade (11)  
507. relativamente (por) uma brusca incapacidade (4)  
508. relativamente súbito a inabilidade (1)  
509. relatividade brusca inabilidável (1)

T13N - Text number 13 - DYSPEPSIA

Nº of translations: 38

EXCESSIVE SMOKING

510. fumando excessivamente (2)  
511. exclusivamente fumando (5)  
512. fumagantes excessivos (1)

GAS-FORMING VEGETABLES

513. vegetais em estado gasoso (8)



514.	vegetais em forma de gases	(2)
515.	vegetais cozidos a gas	(3)
516.	forma de (        ) vegetal	(1)
517.	que fermentam gases	(2)
518.	(com) vegetais	(16)

(PROLONG) GASTRIC EMPTYING TIME

519.	um (prolongado) período de esvaziamento gástrico	(6)
520.	esvaziamento (prolongado)	(11)
521.	esvaziamento gástrico (prolongado)	(3)
522.	(prolongamento) gástrico despejando	(1)
523.	o tempo vazio gástrico	(1)

T14N - Text number 14 - CALCULI

Nº of translations: 38

RENAL PAPILLAE

524.	glândulas renais	(16)
525.	papilos renais	(2)

A WAXY, ALMOST TRANSPARENT APPEARANCE

526.	aparência transparente	(3)
527.	uma cera de aparência quase transparente	(12)
528.	uma cera e aparência mais transparente	(1)
529.	cera com aspecto transparente	(1)
530.	uma aparência pegajosa e que transparece	(1)
531.	uma cor pálida, aparentemente transparente	(1)

A LARGE STAG-HORN STONE

532.	grande pedra	(7)
533.	grande chifre de veado	(1)

- |      |                                   |      |
|------|-----------------------------------|------|
| 534. | grande pedra chifre de veado      | (13) |
| 535. | pedra em chifre de veado          | (5)  |
| 536. | um largo veado de chifre de pedra | (1)  |

## 2.2. Wbt/irg errors

### 2.2.1. Wbt and irg errors in non-specific texts.

2.2.1.1. Wbt and irg errors in non-specific texts, by Physics students.

2.2.1.2. Wbt and irg errors in non-specific texts, by Nursing students.

T1C - Non-specific text

2.2.1. Wbt and irg errors made by the Physics Group  
and by the Nursing Group

T1C - Text EDUCATION IN BRAZIL

WORD-BOUND TRANSLATION ERRORS

THE PUBLIC AUTHORITY'S RESPONSIBILITIES

- |    |                                      |     |
|----|--------------------------------------|-----|
| 1. | as públicas autoridades responsáveis | (6) |
| 2. | a pública autoridade responsável     | (1) |

BOTH PUBLIC AND PRIVATE INSTITUTIONS

- |    |   |     |
|----|---|-----|
| 3. | ambos público e particular instituições | (1) |
|----|---|-----|

EDUCATIONAL POLICY

- |    |                      |     |
|----|----------------------|-----|
| 4. | educação policial    | (1) |
| 5. | educacional política | (6) |
| 6. | educação política    | (1) |
| 7. | educação e política  | (2) |

#### THE CHANGING NEEDS

- 8. as mudanças necessárias (15)
- 9. mudanças precisas (2)

#### THE FEDERAL SCHOOL SYSTEM

- 10. o federal e escolar sistema (1)

#### THE NATIONAL EDUCATIONAL SYSTEM

- 11. o nacional e educacional sistema (4)

#### A NEW UNIVERSITY TEACHING LAW

- 12. uma nova universidade ensinando lei (1)

#### ADMINISTRATIVE ACTIVITIES

- 13. administração e atividades (1)

#### THE COUNTRY'S UNIVERSITIES

- 14. os países universitários (1)
- 15. cidades universitárias (3)

#### EXTENSION OBJECTIVES

- 16. extensão e objetivos (1)
- 17. extensão objetiva (6)
- 18. extensão objetivos (8)

#### DEPARTMENT SYSTEM

- 19. departamento e sistema

#### UNIVERSITY TEACHING METHODS

- 20. universidade ensinando métodos (3)
- 21. universidade, ensino e métodos (2)

INADEQUATE INSERTION OF A RANKSHIFTED GROUP

TEACHING LAW

- 22. o ensino de leis (4)
- 23. o ensinamento de lei (2)

THE COUNTRY'S DEVELOPMENTAL NEEDS

- 24. o país do desenvolvimento preciso (3)

THE CHANGING NEEDS

- 25. mudanças nas necessidades (1)

THE FEDERAL SCHOOL SYSTEM

- 26. as federais escolas do sistema (2)

THE NATIONAL EDUCATIONAL SYSTEM

- 27. a nacional educação do sistema (4)

A NEW UNIVERSITY TEACHING LAW

- 28. uma nova universidade de ensinamento de lei (2)

THE COUNTRY'S UNIVERSITIES

- 29. os países dos universitários (2)

A HIGH-SCHOOL LEVEL

- 30. alta escola de nível (4)

EXTENSION OBJECTIVES

- 31. extensão de objetivos (15)
- 32. extensão dos objetivados (1)

UNIVERSITY ACADEMIC ACTIVITIES

- 33. universidade de acadêmica atividade (2)

## ADMINISTRATIVE ACTIVITIES

34. administração das atividades (2)

## DEPARTMENT SYSTEM

35. departamento de sistema (1)

## T2C - Text RACE HEREDITY

### WORD-BOUND TRANSLATION ERRORS

## SKIN COLOUR

36. pele e cor (2)  
37. pele colorida (3)  
38. epiderme colorida (2)

## NEGROID RACES

39. negros e raças (2)  
40. negróide raças (1)

## HAIR TYPE

41. cabelo, tipo (2)

## HEAD SHAPE

42. cabeça moldada (2)  
43. cabeça e forma (2)

## SICKLE-CELL ANEMIA

44. sickle-célula anemia (2)  
45. sickle-célula anêmica (2)  
46. "sickle-cell" anemia (2)

## RH-NEGATIVE FACTORS

47. Rh-negativo, fatores (2)

48. Rh-negativo e fatores (1)

THE TALL, THIN SHAPE (OF SOME TRIBES)

49. o alto, delgada forma (3)

50. o alto, os magros e forma (2)

51. o alto, magra forma (3)

EFFICIENT HEAT LOSS

52. eficiente calor e perda (1)

ENVIRONMENTAL FORCES

53. ambiental forças (1)

INADEQUATE INSERTION OF A RANKSHIFTED GROUP

SKIN COLOUR

54. pele de cor (3)

HAIR TYPE

55. cabelo do tipo (3)

NEGROID RACES

56. negros de raças (2)

HUMAN SPECIES

57. humana em espécies (1)

SICKLE-CELL ANEMIA

58. foice-célula de anemia (1)

HEREDITY FORM

59. hereditário em forma (2)

THE INTERVENING SEMITIC PEOPLES

60. intervenção semítica de povos (4)

LARGER BODY SURFACES

61. maior corpo da superfície (5)

62. o mais largo corpo de superfície (2)

EFFICIENT HEAT LOSS

63. eficiência do calor perdido (1)

2.2.1.1. wbt and irg errors, by the Physics students.

TIC - Text EDUCATION IN BRAZIL

WBT ERRORS - Physics Group

THE PUBLIC AUTHORITY'S RESPONSIBILITIES

1. as públicas autoridades responsáveis (6)

BOTH PUBLIC AND PRIVATE INSTITUTIONS

2. ambos público e particular instituições (1)

EDUCATIONAL POLICY

3. educacional política (6)

4. educação e política (2)

THE CHANGING NEEDS

5. as mudanças necessárias (15)

THE FEDERAL SCHOOL SYSTEM

6. o federal e escolar sistema (1)

THE NATIONAL EDUCACIONAL SYSTEM

7. o nacional e educacional sistema (4)

A NEW UNIVERSITY TEACHING LAW

8. uma nova universidade ensinando lei (1)

THE COUNTRY'S UNIVERSITIES

9. os países universitários (1)  
10. cidades universitárias (3)

EXTENSION OBJECTIVES

11. extensão objetivos (8)

UNIVERSITY TEACHING METHODS

12. universidade, ensino e métodos (2)

INADEQUATE INSERTION OF A RANKSHIFTED GROUP

THE COUNTRY'S DEVELOPMENTAL NEEDS

1. o país do desenvolvimento preciso (3)

THE CHANGING NEEDS

2. mudanças nas necessidades (1)

THE FEDERAL SCHOOL SYSTEM

3. as federais escolas do sistema (2)

A HIGH-SCHOOL LEVEL

4. alta escola de nível (4)

T2C - Text RACE AND HEREDITY

WBT ERRORS - Physics Group

SKIN COLOUR

1. pele e cor (2)  
2. pele colorida (3)

NEGROID RACES

3. negros e raças (2)



4. negrõide raças (1)

SICKLE-CELL ANEMIA

5. sickle-célula anemia (2)  
6. sickle-célula anêmica (2)  
7. "sickle-cell" anemia (2)

RH-NEGATIVE FACTORS

8. Rh-negativo, fatores (2)  
9. Rh-negativo e fatores (1)

THE TALL, THIN SHAPE (OF SOME TRIBES)

10. o alto, delgada forma (3)

ENVIRONMENTAL FORCES

11. ambiental forças (1)

INADEQUATE INSERTION OF A RANKSHIFTED GROUP

SKIN COLOUR

1. pele de cor (3)

NEGROID RACES

2. negros de raças (2)

HUMAN SPECIES

3. humana em espécies (1)

SICKLE-CELL ANEMIA

4. foice-célula de anemia (1)

HEREDITY FORM

5. hereditário em forma (2)

## LARGER BODY SURFACES

6. maior corpo da superfície (5)

2.2.1.2. Wbt and irg errors, by the Nursing students.

## TIC - Text EDUCATION IN BRAZIL

### WBT ERRORS - Nursing Group

## THE PUBLIC AUTHORITY'S RESPONSIBILITIES

1. a pública autoridade responsável (1)

## EDUCATIONAL POLICY

2. educação policial (1)
3. educação política (1)

## THE CHANGING NEEDS

4. mudanças precisas (2)

## ADMINISTRATIVE ACTIVITIES

5. administração e atividades (1)

## EXTENSION OBJECTIVES

6. extensão e objetivos (1)
7. extensão objetiva (6)

## DEPARTMENT SYSTEM

8. departamento e sistema (2)

## UNIVERSITY TEACHING METHODS

9. universidade ensinando métodos (3)

## INADEQUATE INSERTION OF A RANKSHIFTED GROUP

#### TEACHING LAW

1. o ensino de leis (4)
2. o ensinamento de lei (2)

#### THE NATIONAL EDUCATIONAL SYSTEM

3. a nacional educação do sistema (4)

#### A NEW UNIVERSITY TEACHING LAW

4. uma nova universidade de ensinamento de lei (2)

#### THE COUNTRY'S UNIVERSITIES

5. os países dos universitários (2)

#### EXTENSION OBJECTIVES

6. extensão de objetivos (15)
7. extensão dos objetivados (1)

#### UNIVERSITY ACADEMIC ACTIVITIES

8. universidade de acadêmica atividade (2)

#### ADMINISTRATIVE ACTIVITIES

9. administração das atividades (2)

#### DEPARTMENT SYSTEM

10. departamento de sistema (1)

#### T2C - Text RACE AND HEREDITY

#### WBT ERRORS - Nursing Group

#### SKIN COLOUR

1. epiderme colorida (2)

#### HAIR TYPE

2. cabelo, tipo (2)

#### HEAD SHAPE

3. cabeça moldada (2)  
4. cabeça e forma (2)

#### THE TALL, THIN SHAPE

5. os altos, os magros e forma (2)  
6. o alto, magra forma (3)

#### EFFICIENT HEAT LOSS

7. eficiente calor e perda (1)

#### INADEQUATE INSERTION OF A RANKSHIFTED GROUP

#### HAIR TYPE

1. cabelo do tipo (3)

#### THE INTERVENING SEMITIC PEOPLES

2. a intervenção semítica de povos (4)

#### LARGER BODY SURFACES

3. o mais largo corpo de superfície (2)

#### EFFICIENT HEAT LOSS

4. eficiência do calor perdido (1)

2.2.2. wbt and irg errors in the specific texts translated  
by the Physics Group

#### TIP - WORD-BOUND TRANSLATION

#### THE MOST HELPFUL MODERN INVENTIONS

1. as mais ũtil moderna invenções (1)

EVERYDAY THINGS

2. todo dia coisas (8)

FOOD MIXERS

3. comida, misturadores (2)

VACUUM CLEANERS

4. vācuo limpador (2)

STEAM ENGINES

5. vapor e māquinas (2)

MOTOR CYCLE

6. motor ciclo (1)

INADEQUATE INSERTION OF A RANKSHIFTED GROUP

ELECTRIC MOTOR

7. a eletricidade do motor (2)

ELECTRIC TRAINS

8. a eletricidade de trens (2)

ELECTRIC RAZORS

9. eletricidade de barbeadores (2)

STEAM ENGINES

10. vapores ou fumaça em māquinas (1)

PETROL ENGINES

11. petrōleo de māquinas (1)

FEW MOVING PARTS

12. pouco movimento de partes (2)

ELECTRIC MOTOR

13. a eletricidade do motor (2)

ELECTRIC SUPPLY LINE

14. eletricidade de suprir linha (2)

ELECTRIC MOTOR

15. eletricidade do motor (2)

MOTOR CYCLE

16. motor de ciclo (1)

POWER POINT

17. força de ponto (2)

ELECTRIC MOTOR

18. eletricidade do motor (2)

T2P - WORD-BOUND TRANSLATION

THE 'NOBLE' METALS

19. o nobre metais (1)

SULPHUR COMPOUNDS

20. enxofre e compostos (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

THE BEST KNOWN EXAMPLE

21. o melhor de conhecido exemplo (1)

ORDINARY IRON

22. ordinário de ferro (2)

#### EXPOSED METALS

23. exposição de metais (5)

#### THE 'NOBLE' METALS

24. a nobreza de metais (1)

#### T3P - WORD-BOUND TRANSLATION

#### PARTICULAR GRADES

25. particular níveis (3)

26. particular e graus (1)

#### INADEQUATE INSERTION OF RANKSHIFTED GROUPS

#### INCREASING QUANTITIES

27. aumento de quantidade (2)

#### SPECIFIC MATERIALS

28. particularidades de materiais (1)

29. particulares de materiais (7)

#### PARTICULAR GRADES

30. particularidade dos graus (1)

#### SPECIAL KIND

31. especial do tipo (1)

#### RELATIVE CHEAPNESS

32. relatividade do barato (2)

#### A WIDER RANGE

33. a mais larga das áreas (1)

T4P- - WORD-BOUND TRANSLATION

STRUCTURAL STEEL

34. estrutura rígida (1)

METAL BARS

35. metal e barras (2)

AIR BUBBLES

36. ar e bolhas (1)

METAL REINFORCEMENTS

37. metais reforçados (3)

38. metal reforços (1)

STEEL REINFORCEMENT

39. o aço reforçado (1)

STRETCHED STEEL WIRES

40. esticado o aço e arames (2)

STEEL WIRES

41. aço e arames (2)

'BUILT IN' STRESS

42. 'construído em' pressão (10)

43. 'construído em' tensão (1)

44. construção em pressão (1)

45. construção em stress (2)

PREFABRICATED UNITS

46. fabricação única (1)

47. prefabricados e unidades (1)



## INADEQUATE INSERTION OF RANKSHIFTED GROUPS

### STRUCTURAL STEEL

- 48. estrutura de ação (2)
- 49. estrutura de fundição (2)
- 50. armação de aço (7)
- 51. estrutura de aço (1)

### REINFORCED CONCRETE

- 52. reforçado com concreto (8)
- 53. reforço de concreto (1)

### ROTATING CYLINDER

- 54. rotação de cilindro (2)

### METAL BARS

- 55. metal de barras (2)

### AIR BUBBLES

- 56. ar de bolhas (6)

### METAL REINFORCEMENTS

- 57. metais de reforço (2)

### STEEL REINFORCEMENT

- 58. a rigidez do reforço (1)

### EXTERNAL LOAD

- 59. external de carga (2)

### STRETCHED STEEL WIRES

- 60. esticado aço de arames (2)

### STEEL WIRES

61. aço de arame (2)

T5P - WORD-BOUND TRANSLATION

ASTRONOMICAL BODY

62. astrônomo corpo (1)

63. astronomia corporal (1)

REQUISITE CONDITIONS

64. os requisitos condicionados (1)

65. os requisitos e condições (1)

66. os requisitos, condições (2)

THE WHOLE UNIVERSE

67. o todo universo (3)

68. o conjunto universo (2)

PLANETARY SYSTEMS

69. planetários sistemático (3)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

ASTRONOMICAL BODY

70. astronauta do corpo (2)

REQUISITE CONDITIONS

71. o requisito de condições (7)

72. planos de condições (1)

PLANETARY SYSTEMS

73. planetas do sistema (1)

T6P - WORD-BOUND TRANSLATION

#### THE NORMAL EVENT

74. o normal eventual (2)

#### PHYSICAL ENVIRONMENT

75. o físico ambiental (1)  
76. a física ambiental (1)

#### INADEQUATE INSERTION OF RANKSHIFTED GROUPS

#### INANIMATE MATTER

77. inanimado da matéria (2)

#### DUE COURSE

78. obrigação do curso (1)

#### DEFINITE KNOWLEDGE

79. definição do conhecimento (1)

#### T7P - WORD-BOUND TRANSLATION

#### THE VIOLET AND ULTRA-VIOLET END

80. violeta e ultra-violeta final (8)  
81. violetas e ultra-violetas final (1)  
82. a violeta, a ultra-violeta e o fim (1)  
83. a violeta, a ultra-violeta, fim (4)

#### A LUMINOUS ATOM

84. a luminosidade atômica (2)

#### ANY MINUTE PIECE

85. algum minuto e pedaço (1)

#### ELECTRIC CHARGE

86. eletricidade carregada (2)

## THE ONLY OBJECT

87. o sō objeto (4)

## INADEQUATE INSERTION OF RANKSHIFTED GROUPS

### NATURAL UNITS

88. natureza de uniões (1)

### A LUMINOUS ATOM

89. a luz do átomo (1)

### ANY MINUTE PIECE

90. algum minuto em pedaço (2)

## T8P - WORD-BOUND TRANSLATION

### EVERY DIFFERENT WAVE-LENGTH

91. toda diferente onda-extensão (1)  
92. cada diferente onda-comprimento (1)

### EXTREME VISIBLE RED RADIATION

93. extremo visível vermelha radiação (1)

### PLANCK'S UNIVERSAL CONSTANT

94. planck's universal constante (6)  
95. tábua universal constante (1)  
96. prancha universal constante (3)

### PLANCK'S CONSTANT

97. Planck's constante (5)  
98. tábua constante (1)  
99. prancha constante (3)

### PULSATING PROPERTIES

- |      |                      |     |
|------|----------------------|-----|
| 100. | vibração propriedade | (1) |
| 101. | pulsação propriedade | (1) |

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

EVERY DIFFERENT WAVE-LENGTH

- |      |                                    |     |
|------|------------------------------------|-----|
| 102. | toda diferente onda de comprimento | (1) |
|------|------------------------------------|-----|

EXTREME VISIBLE RED RADIATION

- |      |   |     |
|------|---|-----|
| 103. | extrema visibilidade para o vermelho radiação | (1) |
| 104. | extrema visibilidade de vermelha radiação     | (4) |
| 105. | extrema de visível vermelha radiação          | (2) |
| 106. | extrema visível de vermelho radiação          | (1) |

PULSATING PROPERTIES

- |      |                           |     |
|------|---------------------------|-----|
| 107. | oscilação de propriedades | (1) |
|------|---------------------------|-----|

T9P - WORD-BOUND TRANSLATION

A RAPIDLY-MOVING PARTICLE

- |      |                                  |      |
|------|----------------------------------|------|
| 108. | uma ligeiramente móvel partícula | (13) |
|------|----------------------------------|------|

EARLY SCIENTISTS

- |      |                  |     |
|------|------------------|-----|
| 109. | antes cientistas | (3) |
| 110. | cedo cientistas  | (1) |

CONSTANT RATIO

- |      |                            |     |
|------|----------------------------|-----|
| 111. | uma constante proporcional | (5) |
|------|----------------------------|-----|

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

A RAPIDLY-MOVING PARTICLE

- |      |                                  |      |
|------|----------------------------------|------|
| 112. | um rápido movimento de partícula | (3)  |
| 113. | uma ligeira mudança de partícula | (13) |

CONSTANT RATIO

114. uma constante de rádio (1)

T10P - WORD-BOUND TRANSLATION

THIS LATTER PART

115. esta mais tardia parte (1)

THE NEXT INSTANT

116. neste instante (13)

INADEQUATE INSERTION OF A RANKSHIFTED GROUP

ALTERNATE FITS

117. alternativas de períodos (3)

T11P - WORD-BOUND TRANSLATION

THIS BIG BANG IDEA

118. esta grande golpeada idéia (1)

INADEQUATE INSERTION OF A RANKSHIFTED GROUP

THIS BIG BANG IDEA

119. esta grande porção de idéias (1)

120. esta grande explosão de idéia (1)

DETAILED EXAMINATION

121. detalhe de examinação (1)

DIFFUSE BACKGROUND MATERIAL

122. a difusão da experiência material (3)

T12P - WORD-BOUND TRANSLATION

EXTREMELY DELICATE METHODS

123. extremos delicados e métodos (1)

DECAY PRODUCTS

124. decadência produtiva

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

DECAY PRODUCTS

125. declínio de produtos (1)  
126. declínio da produção (2)

2.2.3. wbt and irg errors in the specific translated  
by the Nursing Group

T1N - WORD-BOUND TRANSLATION

SPECIAL NERVES

1. especial nervos (2)

THE THIN, FLEXIBLE DRUM

2. o magro, flexível tímpano (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

THE OUTER EAR

3. o exterior do ouvido (5)  
4. o externo do ouvido (1)

THE THIN, FLEXIBLE DRUM

5. a delgada flexão do tímpano (6)

THE INNER EAR

6. o interior do ouvido (10)

- 7. o interior da orelha (3)
- 8. o anterior do ouvido (1)

#### A SPIRAL SHELL-LIKE STRUCTURE

- 9. espiral em concha como estrutura (1)

#### THREE TINY DOUGHNUT-SHAPED HOLLOW TUBES

- 10. três pequenas massas formadas de ocos tubos (9)
- 11. três pequenos sonhos de modelo côncavo tubos (1)

#### T2N - WORD-BOUND TRANSLATION

##### A RESULTANT DROP

- 12. o resultado pingó (3)
- 13. uma resultante denúncia (2)
- 14. um resultado, diminuição (2)

##### TEST ANIMALS

- 15. experiência animais (2)
- 16. teste animais (2)

##### VIRUS INFECTION

- 17. vírus infecção (10)
- 18. vírus contágio (2)

##### CERTAIN PATTERNS

- 19. o certo padrão (7)

#### INADEQUATE INSERTION OF RANKSHIFTED GROUPS

##### AN INFECTIOUS VIRUS

- 20. uma infecção de vírus (3)

##### A RESULTANT DROP



- |     |                       |      |
|-----|-----------------------|------|
| 21. | um resultado em gotas | (10) |
| 22. | o resultado da queda  | (1)  |

#### TEST ANIMALS

- |     |                   |     |
|-----|-------------------|-----|
| 23. | testes em animais | (4) |
| 24. | testes no animal  | (1) |
| 25. | teste de animais  | (1) |

#### VIRUS INFECTION

- |     |                   |     |
|-----|-------------------|-----|
| 26. | virus de infecção | (3) |
|-----|-------------------|-----|

#### T3N - WORD-BOUND TRANSLATION

##### THE RIGHT COLON

- |     |              |     |
|-----|--------------|-----|
| 27. | o certo colo | (1) |
|-----|--------------|-----|

##### THE LEFT COLIC FLEXURE

- |     |                        |     |
|-----|------------------------|-----|
| 28. | esquerda cônica flexão | (1) |
|-----|------------------------|-----|

##### THE MARGINAL LYMPH NODES (1st Time)

- |     |                          |     |
|-----|--------------------------|-----|
| 29. | a marginal linfa nódulos | (1) |
|-----|--------------------------|-----|

##### THE MARGINAL LYMPH NODES (2nd Time)

- |     |                          |     |
|-----|--------------------------|-----|
| 30. | a marginal linfa nódulos | (1) |
|-----|--------------------------|-----|

##### THE LYMPH NODE STATIONS

- |     |                            |     |
|-----|----------------------------|-----|
| 31. | a linfa nódulo transmissor | (1) |
|-----|----------------------------|-----|

##### THE LEFT COLIC ARTERIES

- |     |                            |     |
|-----|----------------------------|-----|
| 32. | o esquerdo cônica artérias | (1) |
|-----|----------------------------|-----|

#### INADEQUATE INSERTION OF RANKSHIFTED GROUPS

##### THE LYMPH DRAINAGE SYSTEM

33. a linfa drenagem do sistema (4)

THE LYMPH DRAINAGE SYSTEM

34. a linfa drenagem do sistema (4)

35. a linfa da drenagem sistemática (1)

THE RIGHT COLON

36. direito do colo (1)

37. a direita de dois pontos (1)

THE MARGINAL LYMPH NODES

38. a margem do linfa nódulos (2)

THE MARGINAL LYMPH NODES

39. a margem da linfa nódulo (6)

THE LYMPH NODE STATIONS

40. o linfa nō da estação (1)

T4N - WORD-BOUND TRANSLATION

THE PATIENTS' NEEDS

41. os pacientes necessários (10)

42. as pacientes necessidades (11)

ROOM AIR

43. sala ar (1)

AN INTEGRATED FEEDBACK CONTROL SYSTEM

44. um integrado feedback, controle e sistema (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

THE PATIENTS' NEEDS

45. o paciente com necessidade (2)

ROOM AIR

46. sala de ar (11)

CHRONIC OBSTRUCTIVE LUNG DISEASE

47. a crônica obstrutiva do pulmão doente (1)

CONGESTIVE HEART FAILURE

48. congestão cardíaca da deficiência (2)

T5N - WORD-BOUND TRANSLATION

ASCENDING INFECTION

49. ascendendo infecção (4)

50. elevado infecção (5)

51. refluxo infectado (1)

NORMAL BLADDER EMPTYING

52. normal bexiga esvaziamento (2)

A DISEASED URETHRA

53. doença uretra (1)

URETHRAL STRICTURE

54. uretral estrutura (1)

FOLLOWING MAJOR SURGICAL PROCEDURES

55. seguinte maior cirúrgico conduta (1)

INADEQUATE BLADDER EMPTYING

56. inadequada bexiga seca (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

#### FOREIGN BODIES

- 57. exterior do corpo (7)
- 58. estranhos dos corpos (1)

#### NORMAL BLADDER EMPTYING

- 59. normalidade da bexiga vazia (1)

#### A DISEASED URETHRA

- 60. um doente da uretra (1)

#### URETHRAL STRICTURE

- 61. uretral da estenose (1)

#### PROLONGED BED REST

- 62. prolongada camada de repouso (4)

#### LOWERED RESISTANCE

- 63. baixa da resistência (1)

#### INADEQUATE BLADDER EMPTYING

- 64. incapacidade da bexiga seca (3)

#### T6N - WORD-BOUND TRANSLATION

#### TISSUE INJURY

- 65. tecido ofendido (3)
- 66. tecido prejudicado (11)
- 67. tecido mal (1)

#### PRESSOR AGENTS

- 68. pressão agente (1)

#### PRONOUNCED RENAL DAMAGE

- 69. renunciado renal dano (1)

70. locutor renal danificado (1)

SUBSEQUENT ACUTE TUBULAR NECROSIS

71. subsequente aguda tubular necrose (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

ACUTE RENAL FAILURE

72. a agudo da insuficiência renal (3)

MARKED OLIGURIA

73. o limite da oligúria (2)

MISMATCHED TRANSFUSION

74. administração de transfusão (2)

T7N - WORD-BOUND TRANSLATION

RESERVE FUNCTIONAL CAPACITY

75. reserva funcional capacidade (3)

T8N - WORD-BOUND TRANSLATION

A GENERAL ACUTE UPPER RESPIRATORY INFECTION

76. geral aguda superior respiratória infecção (1)

THE COMMON COLD

77. comum frio (7)

A PYOGENIC OR VIRUS INFECTION

78. piogênica ou virus infeccioso (1)

79. pyogenic ou virus infeccioso (11)

PREDISPOSING OR CONTRIBUTORY FACTORS

80. predisposta ou responsável fatores (1)

81. predispondo ou contributivos fatores (3)

CHRONIC PULMONARY OR CARDIAC DISEASE

82. crônica pulmonar ou cardíaca doença (12)

RECURRING ATTACKS

83. ocorrendo ataques (1)

84. recorrendo ataques (4)

85. voltando ataques (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

A PYOGENIC OR VIRUS INFECTION

86. (de uma) pyogenic de virus infeccioso (11)

CHRONIC PULMONARY OR CARDIAC DISEASE

87. crônico pulmonar do cardíaco doente (2)

T9N - WORD-BOUND TRANSLATION

SYSTEMIC, ENDOCRINE OR CYTOGENETIC FACTORS

88. sistêmico, endócrino ou citogenético fatores (1)

THE DOUBLE DIDELPHIC UTERUS

89. o dobro ou didélfico úteros (3)

SUBMUCOUS FIBROIDS

90. o submucos fibrosas (1)

91. submuco fibróide (1)

92. submucos fibróides (13)

93. submucosa fibróides (3)

94. submuco fibroso (1)

95. submucos fibrados (2)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

A FIXED RETRODISPLACED UTERUS

96. um determinado resto de placenta uterina (2)  
97. a fixação retrodeslocada do útero (5)  
98. uma fixa retrodisplacenta do útero (1)

AN OLD HEALED INFLAMMATORY PROCESS

99. um velho curado de inflamatório processo (2)

A SILENT OR SYMPTOMATIC CAUSE

100. uma calma ou sintoma da causa (1)

TION - WORD-BOUND TRANSLATION

THE INTERNAL CERVICAL OS

101. a interna cervical a abertura (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

THE THIRD TRIMESTER

102. um terço do trimestre (14)

ADVANCING MATERNAL AGE

103. o progresso maternal de idade (2)  
104. o avançamento maternal da idade (1)

INCREASING PARITY

105. crescimento da igualdade (2)  
106. aumento de paridade (2)

T12N - WORD-BOUND TRANSLATION

THE RELATIVELY SUDDEN INABILITY

107. relatividade súbita incapacitada (4)  
 108. relatividade repentina inabilitada (7)  
 109. relatividade brusca inabilidável (1)

INADEQUATE INSERTION OF RANKSHIFTED GROUPS

GROSS CHEMICAL DERANGEMENT

110. rude química de desarranjo (2)

THE RELATIVELY SUDDEN INABILITY

111. a relatividade súbita da inabilidade (2)  
 112. o relativo súbito de inabilidade (11)

T14N - INADEQUATE INSERTION OF RANKSHIFTED GROUPS

A LARGE STAG-HORN STONE

113. um largo veado de chifre de pedra (1)

2.2.4. List of wbt and irg errors plus co-occurring aspects, with the percentage and number of students that made those errors.

List I

Errors of sequence and non-recognition of 's structure

Number of students: 62 in the two text common to both groups

Std = number of students that made the error

THE PUBLIC AUTHORITY'S RESPONSIBILITIES	Std	%
as públicas autoridades responsáveis	6	9,68
a pública autoridade responsável	1	1,61
THE COUNTRY'S UNIVERSITIES		
os países universitários	1	1,61



	<u>Std</u>	<u>%</u>
idades universitárias	3	4,84

Number of students in the Nursing Group: 38

#### THE PATIENTS' NEEDS

os pacientes necessários	10	26,31
as pacientes necessidades	11	28,95

#### List II

##### Errors of sequence in 's structure

Number of students: 62 in the two texts common to both groups

Std = number of students that made the error

THE COUNTRY'S DEVELOPMENTAL NEEDS	<u>Std</u>	<u>%</u>
o país do desenvolvimento preciso	3	4,84
THE COUNTRY'S UNIVERSITIES		
os países dos universitários	2	3,23

#### List III

##### Errors of sequence, lexis and non-recognition of 's structure

Number of students in the Physics Group: 24

Std = number of students that made the error

PLANCK'S UNIVERSAL CONSTANT	<u>Std</u>	<u>%</u>
planck's universal constante	6	25
tābua universal constante	1	4,17
prancha universal constante	3	12,5

PLANCK'S CONSTANT	Std	%
planck's constante	5	21
tābua constante	1	4,17
prancha constante	3	12,5

#### List IV

##### Errors of sequence with Portuguese deviant forms

Number of students: 62 in the texts common to both groups

Std = number of students that made the error

BOTH PUBLIC AND PRIVATE INSTITUTIONS	Std	%
ambos pūblico e particular instituições	1	1,61
EDUCATIONAL POLICY		
educacional política	6	9,68
THE FEDERAL SCHOOL SYSTEM		
o federal e escolar sistema	1	1,61
THE NATIONAL EDUCATIONAL SYSTEM		
o nacional e educacional sistema	4	6,45
NEGROID RACES		
negrōide raças	1	1,61
ENVIRONMENTAL FORCES		
ambiental forças	1	1,61

Number of students in the Physics Group: 24

THE MOST USEFUL MODERN INVENTIONS		
as mais ūtil moderna invenções	1	4,17

# THE 'NOBLE' METALS

o nobre metais

Std	%
-----	---

1	4,17
---	------

## PARTICULAR GRADES

particular nı́veis

3	12,5
---	------

Number of students in the Nursing Group: 38

## SPECIAL NERVES

especial nervos

2	5,26
---	------

## THE RIGHT COLON

o certo colo

1	2,63
---	------

## ASCENDING INFECTION

ascendendo infecção

4	10,53
---	-------

elevado infecção

5	13,16
---	-------

## PRONOUNCED RENAL DAMAGE

prenunciado renal dano

1	2,63
---	------

## SUBSEQUENT ACUTE TUBULAR NECROSIS

subsequente aguda tubular necrose

1	2,63
---	------

## A GENERAL ACUTE UPPER RESPIRATORY INFECTION

geral aguda superior respiratōria infecção

1	2,63
---	------

## THE COMMON COLD

comum frio

7	18,42
---	-------

## PREDISPOSING OR CONTRIBUTORY FACTORS

predisposta ou responsāvel fatores

1	2,63
---	------

predispondo ou contributivos fatores

3	7,89
---	------

RECURRING ATTACKS	Std	%
ocorrendo ataques	1	2,63
recorrendo ataques	4	10,53
voltando ataques	1	2,63
SUBMUCOUS FIBROIDS		
submucosa fibróides	3	7,89
SYSTEMIC, ENDOCRINE OR CYTOGENETIC FACTORS		
sistêmico, endócrino ou citogenético fatores	1	2,63

#### List V

##### Errors of sequence and non-recognition of H

Number of students: 62 in the texts common to both groups

Std = number of students that made the errors

EDUCATIONAL POLICY	Std	%
educação política	1	1,61
educação policial	1	1,61
THE CHANGING NEEDS		
mudanças necessárias	15	24,19
mudança necessária	1	1,61
mudanças precisas	2	3,22
EXTENSION OBJECTIVES		
extensão objetiva	6	9,68
SKIN COLOUR		
pele colorida	3	4,84
epiderme colorida	2	3,22

HEAD SHAPE	Std	%
cabeça moldada	2	3,22
SICKLE-CELL ANEMIA		
sickle-célula anêmica	2	3,22
Number of students in the Physics Group: <u>24</u>		
VACUUM CLEANER		
vácuo limpador	2	3,22
STRUCTURAL STEEL		
estrutura rígida	1	4,17
METAL REINFORCEMENTS		
metais reforçados	3	12,5
STEEL REINFORCEMENTS		
aço reforçado	1	4,17
"BUILT IN" STRESS		
'construído em' pressão	10	41,67
'construído em' tensão	1	4,17
construção em pressão	1	4,17
construção em stress	2	8,33
PREFABRICATED UNITS		
prefabricação única	1	4,17
ASTRONOMICAL BODY		
astronomia corporal	1	4,17
REQUISITE CONDITIONS		
requisitos condicionados	1	4,17

THE WHOLE UNIVERSE	Std	%
o todo universo	3	12,5
o conjunto universo	2	8,33
PLANETARY SYSTEM		
planetário sistemático	3	12,5
THE NORMAL EVENT		
o normal eventual	2	8,33
PHYSICAL ENVIRONMENT		
o físico ambiental	1	4,17
a física ambiental	1	4,17
THE VIOLET AND ULTRA-VIOLET END		
violeta e ultra-violeta final	8	33,33
LUMINOUS ATOM		
luminosidade atômica	2	8,33
ELECTRIC CHARGE		
eletricidade carregada	2	8,33
EVERY DIFFERENT WAVE-LENGTH		
toda diferente onda-extensão	1	4,17
cada diferente onda-comprimento	1	4,17
CONSTANT RATIO		
constante proporcional	5	20,83
DECAY PRODUCTS		
decadência produtiva	2	8,33

Number of students in the Nursing Group: 38

ASCENDING INFECTION	Std	%
refluxo infectado	1	2,63
INADEQUATE BLADDER EMPTYING		
inadequada bexiga seca	1	2,63
TISSUE INJURY		
tecido ofendido	3	7,89
tecido prejudicado	11	28,95
tecido mal	1	2,63
PRONOUNCED RENAL DAMAGE		
locutor renal danificado	1	2,63
RESERVE FUNCTIONAL CAPACITY		
reserva funcional capacitada	3	7,89
PYOGENIC OR VIRUS INFECTION		
"pyogenic" ou virus infeccioso	11	28,95
SUBMUCOUS FIBROIDS		
submucos fibrosas	1	2,63
submucos fibróide	1	2,63
submucos fibróides	13	34,21
submucos fibroso	1	2,63
submucos fibrados	2	5,26
THE RELATIVELY SUDDEN INABILITY		
relatividade súbita incapacitada	4	10,53
relatividade repentina inabilitada	7	18,42
relatividade brusca inabilitável	1	2,63

# List VI

## Errors of sequence and production of two or more Hs

Number of students: 62 in the texts common to both groups

Std = number of students that made the error

EDUCATIONAL POLICY	Std	%
educação e política	2	3,22
ADMINISTRATIVE ACTIVITIES		
administração e atividades	1	1,61
EXTENSION OBJECTIVES		
extensão e objetivos	1	1,61
extensão, objetivos	1	12,90
DEPARTMENT SYSTEM		
departamento e sistema	2	3,22
SKIN COLOUR		
pele e cor	2	3,22
HAIR TYPE		
cabelo, tipo	2	3,22
HEAD SHAPE		
cabeça e forma	2	3,22
NEGROID RACES		
negros e raças	2	3,22
SICKLE-CELL ANEMIA		
sickle- célula anemia	2	3,22
RH-NEGATIVE FACTORS		
Rh-negativo, fatores	2	3,22
Rh-negativ e fatores	1	1,61



# THE TALL, THIN SHAPE

	Std	%
o alto, delgada forma	3	4,84
os altos, os magros a forma	2	3,22
o alto, magra forma	3	4,84

# EFFICIENT HEAT LOSS

eficiente calor e perda	1	1,61
-------------------------	---	------

Number of students the Physics Group: 24

# EVERYDAY THINGS

todo dia coisas	8	33,33
-----------------	---	-------

# FOOD MIXERS

comida, misturadores	2	8,33
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# STEAM ENGINE

vapor e máquinas	2	8,33
------------------	---	------

# MOTOR CYCLE

motor, ciclo	1	4,17
--------------	---	------

# SULPHUR COMPOUNDS

enxofre e compostos	1	4,17
---------------------	---	------

# PARTICULAR GRADES

particular e graus	1	4,17
--------------------	---	------

# METAL BARS

metais e barras	2	8,33
-----------------	---	------

# AIR BUBBLES

ar e bolhas	1	4,17
-------------	---	------

# METAL REINFORCEMENTS

	Std	%
metal reforços	1	4,17
STRETCHED STEEL WIRES		
esticados o aço e arames	2	8,33
STEEL WIRES		
aço e arames	2	8,33
PREFABRICATED UNITS		
prefabricados e unidades	1	4,17
ASTRONOMICAL BODY		
astrônomo corpo	1	4,17
REQUISITE CONDITIONS		
requisitos e condições	1	4,17
requisitos, condições	2	8,33
VIOLET AND ULTRA-VIOLET END		
violetas e ultra-violetas final	1	4,17
a violeta, a ultra-violeta e o fim	1	4,17
a violeta, a ultra-violeta, fim	4	16,67
ANY MINUTE PIECE		
algum minuto e pedaço	1	4,17
EXTREME VISIBLE RED RADIATION		
extremo visível vermelha radiação	1	4,17
PULSATING PROPERTIES		
vibração propriedade	1	4,17
pulsação propriedade	1	4,17

## EXTREMELY DELICATE METHODS

extremos delicados e métodos

Std	%
-----	---

1	4,17
---	------

Number of students in the Nursing Group: 38

## A RESULTANT DROP

o resultado pingo

3	7,89
---	------

um resultado, diminuição

2	5,26
---	------

## TEST ANIMALS

experiência animais

2	5,26
---	------

teste animais

2	5,26
---	------

## VIRUS INFECTION

virus infecção

10	26,31
----	-------

virus contágio

2	5,26
---	------

## THE LEFT COLIC FLEXURE

esquerda cólica flexão

1	2,63
---	------

## THE MARGINAL LYMPH NODES (1st Time)

a marginal linfa nódulos

1	2,63
---	------

## THE MARGINAL LYMPH NODES (2nd Time)

a marginal linfa nódulos

1	2,63
---	------

## THE LYMPH NODE STATIONS

a linfa nódulo transmissor

1	2,63
---	------

## THE LEFT COLIC ARTERIES

a esquerda cólica artérias

1	2,63
---	------

## ROOM AIR

sala ar

1	2,63
---	------

AN INTEGRATED FEEDBACK CONTROL SYSTEM	Std	%
um integrado feedback, controle e sistema	1	2,63
NORMAL BLADDER EMPTYING		
normal bexiga esvaziamento	2	5,26
A DISEASED URETHRA		
doença uretra	1	2,63
FOLLOWING MAJOR SURGICAL PROCEDURES		
seguinte maior cirúrgico conduta	1	2,63
PRESSOR AGENT		
pressão agente	1	2,63
PYOGENIC OR VIRUS INFECTION		
piogênica ou virus infeccioso	1	2,63
CHRONIC PULMONARY OR CARDIAC DISEASE		
crônica pulmonar ou cardíaca doença	12	31,58
THE DOUBLE OR DIDELPHIC UTERUS		
o dobro ou didélfico úteros	3	7,89
THE INTERNAL CERVICAL OS		
a interna cervical a abertura	1	2,63

#### List VII

Partial translation with recognition of H

Number of students: 62 in the texts common to both groups

Std = number of students that made the error

SICKLE-CELL ANEMIA	Std	%
"sickle-cell" anemia	2	3,22

# List VIII

## Errors of sequence and unnecessary insertion of rankshifted groups

Number of students: 62 in the texts common to both  
groups

Std = number of students that made the error

THE CHANGING NEEDS	Std	%
mudanças nas necessidades	1	1,61
THE FEDERAL SCHOOL SYSTEM		
as federais escolas do sistema	2	3,22
A HIGH-SCHOOL LEVEL		
alta escola de nível	4	6,45
THE NATIONAL EDUCATIONAL SYSTEM		
a nacional educação do sistema	4	6,45
ADMINISTRATIVE ACTIVITIES		
administração das atividades	2	3,22
UNIVERSITY ACADEMIC ACTIVITIES		
universidade de acadêmica atividade	2	3,22
DEPARTMENT SYSTEM		
departamento de sistema	1	1,61
NEGROID RACES		
negros de raças	2	3,22
HUMAN SPECIES		
humana em espécie	1	1,61
SICKLE-CELL ANEMIA		

	Std	%
foice-célula de anemia	1	1,61
HEREDITARY FORM		
hereditário em forma	2	3,22
THE INTERVENING SEMITIC PEOPLES		
a intervenção semítica de povos	4	6,45
LARGER BODY SURFACES		
maior corpo da superfície	5	8,06
o mais largo corpo de superfície	2	3,22
Number of students in the Physics Group: <u>24</u>		
ELECTRIC MOTORS		
a eletricidade do motor	2	8,33
ELECTRIC TRAINS		
a eletricidade de trens	2	8,33
ELECTRIC RAZORS		
a eletricidade de barbeadores	2	8,33
ELECTRIC MOTOR		
a eletricidade do motor	2	8,33
MOTOR CYCLE		
o motor de ciclo	1	4,17
ELECTRIC MOTOR		
a eletricidade do motor	2	8,33
FEW MOVING PARTS		
pouco movimento de partes	2	8,33

ELECTRIC MOTOR	Std	%
a eletricidade do motor	2	8,33
THE BEST KNOWN EXAMPLE		
o melhor de conhecido exemplo	1	4,17
ORDINARY IRON		
ordinário de ferro	2	8,33
EXPOSED METALS		
exposição de metais	5	20,83
THE 'NOBLE' METALS		
a nobreza de metais	1	4,17
INCREASING QUANTITIES		
aumento de quantidade	2	8,33
SPECIFIC MATERIALS		
peculiaridades de materiais	1	4,17
particulares de materiais	7	29,17
PARTICULAR GRADES		
particularidade dos graus	7	29,17
SPECIAL KINDS		
especial do tipo	1	4,17
RELATIVE CHEAPNESS		
relatividade do barato	2	8,33
A WIDER RANGE		
a mais larga das áreas	1	4,17

STRUCTURAL STEEL	Std	%
estrutura de aço	2	8,33
estrutura de fundição	2	8,33
armação de aço	7	29,17
estrutura de aço	1	4,17
REINFORCED CONCRETE		
reforçado com concreto	8	33,33
reforço de concreto	1	4,17
ROTATING CYLINDER		
rotação de cilindros	2	8,33
METAL BARS		
metal de barras	2	8,33
METAL REINFORCEMENTS		
metais de reforço	2	8,33
EXTERNAL LOAD		
external de carga	2	8,33
ASTRONOMICAL BODY		
astronauta do corpo	2	8,33
REQUISITE CONDITIONS		
o requisito de condições	7	29,17
planos de condições	1	4,17
PLANETARY SYSTEM		
planetas do sistema	1	4,17
INANIMATE MATTER		



	Std	%
inanimado da matéria	2	8,33
DUE COURSE		
obrigação do curso	1	4,17
DEFINITE KNOWLEDGE		
definição do conhecimento	1	4,17
NATURAL UNITS		
natureza de uniões	1	4,17
LUMINOUS ATOM		
a luz do átomo	1	4,17
ANY MINUTE PIECE		
algum minuto em pedaço	2	8,33
PULSATING PROPERTIES		
oscilação de propriedades	1	4,17
CONSTANT RATIO		
uma constante de rádio	1	4,17
ALTERNATIVE FITS		
alternativas de períodos	3	12,5
DETAILED EXAMINATION		
detalhe de examinação	1	4,17
Number of students in the Nursing Group: <u>38</u>		
THE OUTER EAR		
o exterior do ouvido	5	13,16
o externo do ouvido	1	2,63

# THE THIN, FLEXIBLE DRUM

a delgada flexão do tímpano

Std

%

6

15,79

# THE INNER EAR

o interior do ouvido

10

26,31

o interior da orelha

3

7,89

o anterior do ouvido

1

2,63

# A INFECTIOUS VIRUS

uma infecção de virus

3

7,89

# A RESULTANT DROP

um resultado em gotas

10

26,31

um resultado da queda

1

2,63

# TEST ANIMALS

testes em animais

4

10,53

teste de animal

1

2,63

teste no animal

1

2,63

# VIRUS INFECTION

virus de infecção

3

7,89

# THE RIGHT COLON

direita do colo

1

2,63

direita de dois pontos

1

2,63

# THE MARGINAL LYMPH NODES

a margem da linfa nódulos

2

5,26

# THE MARGINAL LYMPH NODES

a margem da linfa nódulo

6

15,79

ROOM AIR	Std	%
sala de ar	11	28,95
CHRONIC OBSTRUCTIVE LUNG DISEASE		
a crônica obstrutiva do pulmão doente	1	2,63
CONGESTIVE HEART FAILURE		
congestão cardíaca da deficiência	2	5,26
FOREIGN BODIES		
exterior do corpo	7	18,42
estranhos dos corpos	1	2,63
A DISEASED URETHRA		
um doente de uretra	1	2,63
URETHRAL STRICTURE		
uretral da estenose	1	2,63
LOWERED RESISTANCE		
baixa de resistência	1	2,63
ACUTE RENAL FAILURE		
o agudo renal da insuficiência	3	7,89
MARKED OLIGURIA		
o limite da oligúria	2	5,26
MISMATCHED TRANSFUSION		
administração de transfusão	2	5,26
PYGENIC OR VIRUS INFECTION		
(de uma) pyogenic de virus infeccioso	11	28,95

CHRONIC PULMONARY OR CARDIAC DISEASE	Std	%
crônico pulmonar do cardíaco doente	2	5,26
A FIXED RETRODISPLACED UTERUS		
um determinado resto de placenta uterina	2	5,26
a fixação retrodeslocada do útero	5	13,16
uma fixa retrodisplacenta do útero	1	2,63
AN OLD HEALED INFLAMMATORY PROCESS		
um velho curado de inflamatório processo	2	5,26
A SILENT OR SYMPTOMATIC CAUSE		
uma calma ou sintoma de causa	1	2,63
THE THIRD TRIMESTER		
um terço do trimestre	14	36,84
ADVANCING MATERNAL AGE		
o progresso maternal de idade	2	5,26
o avançamento maternal da idade	1	2,63
INCREASING PARITY		
crescimento da igualdade	2	5,26
aumento da paridade	2	5,26
GROSS CHEMICAL DERANGEMENT		
rude química de desarranjo	2	5,26
THE RELATIVELY SUDDEN INABILITY		
a relatividade súbita da inabilidade	2	5,26
o relativo súbito de inabilidade	11	28,95

## List IX

### Errors of sequence and addition of inadequate rankshifted groups

Number of students: 62 in the texts common to both  
groups

Std = number of students that made the error

A NEW UNIVERSITY TEACHING LAW	Std	%
uma nova universidade de ensinamento de lei	2	3,22
TEACHING LAW		
ensino de lei	4	6,45
ensinamento de lei	2	3,22
EXTENSION OBJECTIVES		
extensão de objetivos	15	24,19
extensão de objetivados	1	1,61
SKIN COLOUR		
pele de cor	3	3,84
HAIR TYPE		
cabelo do tipo	3	4,84
EFFICIENT HEAT LOSS		
eficiência do calor perdido	1	1,61
Number of students in the Physics Group: <u>24</u>		
STEAM ENGINE		
vapores ou fumaça em máquinas	1	4,17
PETROL ENGINES		
petrôleo de máquinas	1	4,17

ELECTRIC SUPPLY LINE	Std	%
eletricidade de suprir linha	2	8,33
POWER POINT		
força de ponto	2	8,33
AIR BUBBLES		
ar de bolhas	6	25
STRETCHED STEEL WIRES		
esticado aço de arame	2	8,33
STEEL REINFORCEMENT		
a rigidez do reforço	1	4,17
STEEL WIRES		
aço de arame	2	8,33
DECAY PRODUCTS		
declínio de produtos	1	4,17
declínio de produção	2	8,33
EVERY DIFFERENT WAVE-LENGTH		
toda diferente onda de comprimento	1	4,17
EXTREME VISIBLE RED RADIATION		
extrema visibilidade para o vermelho radiação	1	4,17
extrema visibilidade de vermelho radiação	4	16,66
extrema de visível vermelha radiação	2	8,33
extrema visível de vermelho radiação	1	4,17
A RAPIDLY-MOVING PARTICLE		
um rápido movimento de partícula	3	12,5

	Std	%
uma ligeira mudança de partícula	13	54,17
THIS BIG BANG IDEA		
esta grande porção de idéia	1	4,17
esta grande explosão de idéia	1	4,17
DIFFUSE BACKGROUND MATERIAL		
difusão de experiência material	3	12,5
Number of students in the Nursing Group: <u>38</u>		
A SPIRAL SHELL-LIKE STRUCTURE		
espiral em concha como estrutura	1	2,63
THREE TINY DOUGHNUT-SHAPED HOLLOW TUBES		
três pequenas massas formadas de ocos tubos	9	23,68
três pequenos sonhos de modelo côncavo tubos	1	2,63
THE LYMPH DRAINAGE SYSTEM (1st Time)		
a linfa drenagem do sistema	4	10,53
THE LYMPH DRAINAGE SYSTEM (2nd Time)		
a linfa drenagem do sistema	4	10,53
a linfa da drenagem sistemática	1	2,63
THE LYMPH NODE STATIONS		
o linfa não da estação	1	2,63
THE PATIENTS' NEEDS		
o paciente com necessidade	2	5,26
PROLONGED BED REST		
prolongada camada de repouso	4	10,53

NORMAL BLADDER EMPTYING	Std	%
normalidade da bexiga vazia	1	2,63
INADEQUATE BLADDER EMPTYING		
imcapacidade da bexiga seca	3	7,89
A LARGE STAG-HORN STONE		
um largo veado de chifre de pedra	1	2,63

#### List X

##### Errors of sequence and lack of rankshifted groups

Number of students: 62 in the texts common to both groups

Std = number of students that made the errors

A NEW UNIVERSITY TEACHING LAW	Std	%
uma nova universidade ensinando lei	1	1,61
UNIVERSITY TEACHING METHODS		
universidade ensinando métodos	3	4,84

Number of students in the Physics Group: 24

#### THIS BIG BANG IDEA

esta grande golpeada idéia	1	1,61
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#### A RAPIDLY-MOVING PARTICLE

uma ligeiramente móvel partícula	13	54,17
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#### List XI

##### INADEQUATE TRANSLATION OF (m)

Number of students in the Physics Group: 24

Std = number of students that made the errors

THE EARLY SCIENTISTS	Std	%
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	<u>Std</u>	<u>%</u>
(os) antes cientistas,	3	12,5
(os) cedo cientistas,	1	4,17

#### List XII

##### Errors of collocation

Number of students in the Nursing Group: 38

Std = number of students that made the errors

	<u>Std</u>	<u>%</u>
THE THIN, FLEXIBLE DRUM		
o magro, flexível tímpano	1	2,63
A RESULTANT DROP		
uma resultante denúncia	2	5,26

#### List XIII

##### Errors due to formal similarity between English and Portuguese, with/without error of sequence

Number of students in the Physics Group: 24

	<u>Std</u>	<u>%</u>
THE ONLY OBJECT		
o só objeto	4	16,7
THIS LATTER PART		
esta mais tardia parte	1	4,17
THE NEXT INSTANT		
neste instante	13	54,17

Number of students in the Nursing Group: 38

URETHRAL STRICTURE		
uretral estrutura	1	2,63

List XIV

Singular for plural with the addition of a deictic

Number of students in the Nursing Group: 38

CERTAIN PATTERNS

	<u>Std</u>	<u>%</u>
o certo padrão	7	18,42

### APPENDIX 3

#### 3. Calculations and statistical hypotheses

##### 3.1. The test of proportion

3.1.1. The test of proportion applied to the results from the non-specific texts, in the Physics Group.

$$H_0: p \geq \frac{1}{3}$$

$$H_1: p < \frac{1}{3}$$

$$z = \frac{(33 - 0,5) - 27,67}{(18,44)^{1/2}} = \frac{4,83}{4,29} = 1,12$$

$$z_{5\%} = -1,64 < 1,12. H_0 \text{ is to be accepted}$$

$$z = \frac{(x - 0,5) - np_0}{np_0 \times (1 - p_0)^{1/2}}$$

3.1.2. The test of proportion applied to the results from the non-specific texts, in the Nursing Group.

$$H_0: p \geq \frac{1}{3}$$

$$H_1: p < \frac{1}{3}$$

$$z = \frac{(30 - 0,5) - 24}{(16,08)^{1/2}} = \frac{5,50}{4,01} = 1,37$$

$$z_{5\%} = -1,65 < 1,12. H_0 \text{ is to be accepted.}$$

3.1.3. The test of proportion applied to the results from the specific texts, in the Physics Group.

$$H_0: p \geq \frac{1}{3}$$

$$H_1: p < \frac{1}{3}$$

$$z = \frac{(126 - 0,5) - 110}{(73,7)^{1/2}} = \frac{15,50}{8,58} = 1,80$$

$z_{5\%} = -1,65 < 1,80$ .  $H_0$  is to be accepted

3.1.4. The test of proportion applied to the results from the specific texts, in the Nursing Group.

$$H_0: p \geq \frac{1}{3}$$

$$H_1: p < \frac{1}{3}$$

$$z = \frac{(113 - 0,5) - 178,6}{(119,66)} = \frac{-66,1}{10,93} = -6,05$$

$z_{5\%} = -1,65 > -6,05$ .  $H_0$  is to be rejected

### 3.2. Test of Student

To verify whether the average of error rates per student, in each ngp, in the specific texts was different from the average of error rates per student, in each ngp, in the non-specific texts, the 't' test of Student, for the difference of averages, was applied ( $\bar{x}_1 \neq \bar{x}_2$ ). The first sample ( $n_1$ ) consists of the two non-specific texts, from which the average ( $\bar{x}_1$ ) of error rates per student, in each ngp, and the standard deviation ( $s_1$ ) have been estimated. The second sample was formed by the specific texts, from which the average ( $\bar{x}_2$ ) of error rates per student, in each ngp, and the standard deviation ( $s_2$ ) have been estimated;  $\bar{x}$  is obtained from the formula  $\bar{x} = \frac{\sum x_i}{n}$  where  $x_i$  is the error rate per student, in each ngp, in each text, and  $n$  is the number of translated texts. The formula for  $s$  is

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$$

We have supposed that  $s_1^2 \neq s_2^2$  and the 't' test was as follows:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left( \frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} \right)^{1/2}}, \quad H_0: \bar{x}_1 = \bar{x}_2 \text{ is to be rejected if}$$

$$t \geq \frac{w_1 t_1 + w_2 t_2}{w_1 + w_2}, \quad \text{in which } w_1 = \frac{s_1^2}{n_1}, \quad w_2 = \frac{s_2^2}{n_2},$$

$$t_1 = t(1 - \frac{\alpha}{2}) (n_1 - 1) \text{ and } t_2 = t(1 - \frac{\alpha}{2}) (n_2 - 1).$$

### 3.2.1. Calculations and statistical hypotheses

Non-specific texts (Physics Group)

$$\bar{x}_1 = 1,52 \quad n_1 = 2 \quad s_1 = 0,19$$

Non-specific texts (Nursing Group)

$$\bar{x}_1 = 0,91 \quad n_1 = 2 \quad s_1 = 0,48$$

Specific texts (Physics Group)

$$\bar{x}_2 = 2,42$$

$$s_2 = 1,42$$

$$n_2 = 12$$

Specific texts (Nursing Group)

$$\bar{x}_2 = 0,95$$

$$n_2 = 14$$

$$s_2 = 0,70$$

#### 3.2.1.1. Non-specific and specific texts (Physics Group)

$$H_0: \bar{x}_1 = \bar{x}_2$$

$$H_1: \bar{x}_1 \neq \bar{x}_2$$

$$t = \frac{1,52 - 2,42}{\left( \frac{(0,19)^2}{2} + \frac{(1,42)^2}{12} \right)^{1/2}} = \frac{-0,90}{0,43} = -2,09$$

$$t_1 = tn_1 - 1; 1 - \frac{\alpha}{2} \Rightarrow t_1 = t_{11}; 0,975 = 12,706$$

$$t_2 = tn_2 - 1; 1 - \frac{\alpha}{2} \Rightarrow t_2 = t_{11}; 0,975 = 12,201$$

$$w_1 = \frac{s_1^2}{n_1} \Rightarrow w_1 = 0,018$$

$$w_2 = \frac{s_2^2}{n_2} \Rightarrow w_2 = 0,168$$

$$t' = \frac{w_1 t_1 + w_2 t_2}{w_1 + w_2} = \frac{0,23 + 0,37}{0,018 + 0,168} = \frac{0,60}{0,19} = 3,16$$

Conclusion: There is no difference between  $\bar{x}_1$  and  $\bar{x}_2$ .  $H_0$  is to be accepted.

### 3.2.1.2. Non-specific and specific texts (Nursing Group)

$$H_0: \bar{x}_1 = \bar{x}_2$$

$$H_1: \bar{x}_1 \neq \bar{x}_2$$

$$t = \frac{0,91 - 0,95}{\left( \frac{(0,48)^2}{2} + \frac{(0,70)^2}{14} \right)^{1/2}} = \frac{-0,04}{0,39} = -0,10$$

$$t_1 = tn_1 - 1; 1 - \frac{\alpha}{2} \Rightarrow t_1 = t_{11}; 0,975 = 12,706$$

$$t_2 = tn_1 - 1; 1 - \frac{\alpha}{2} \Rightarrow t_2 = t_{13}; 0,975 = 2,160$$

$$w_1 = \frac{s_1^2}{n_1} = 0,115$$

$$w_2 = \frac{s_1^2}{n_2} = 0,035$$

$$t' = \frac{w_1 t_1 + w_2 t_2}{w_1 + w_2} = \frac{1,46 + 0,08}{0,15} = \frac{1,54}{0,15} = 10,27$$

Conclusion: There is no difference between  $\bar{x}_1$  and  $\bar{x}_2$ .  $H_0$  is to be accepted.

3.3. The correlation rate was obtained from the formula:

$$r_{xy} = \frac{\Sigma x \cdot y}{(\Sigma x^2 \times \Sigma y^2)^{1/2}}, \text{ in which } x \text{ stands for } \underline{\text{wbt}} \text{ error rate per}$$

student, in each ngp, or for irg error rate per student, in each ngp, in each type of text, and  $y$  stands for the number of words forming the ngps, which are found in both types of texts.

3.3.1. The correlation rates in the non-specific texts

3.3.1.1. wbt error rates and the number of words in the ngps

$$r = \frac{4,84}{\sqrt{1,2414 \times 29}} = \frac{4,48}{\sqrt{36,0005}} = \frac{4,84}{6,00005} = 0,81 = 81\%$$

3.3.1.2. irg error rates and the number of words in the ngps

$$r = \frac{3,32}{\sqrt{0,4966 \times 29}} = \frac{3,32}{\sqrt{14,40}} = \frac{3,32}{3,79} = 0,87 = 87\%$$

3.3.2. The correlation rates in the specific texts

3.3.2.1. Physics Group:

3.3.2.1.1. wbt error rates and the number of words in

the ngps

$$P = \frac{12,02}{\sqrt{5,1752 \times 29}} = \frac{12,02}{\sqrt{150,0808}} = \frac{12,02}{12,250745} = 0,98 = 98\%$$

3.3.2.1.2. irg error rates and the number of words in the ngps

$$P = \frac{16,78}{\sqrt{10,3053 \times 29}} = \frac{16,78}{\sqrt{298,8537}} = \frac{16,78}{17,287385} = 0,97 = 97\%$$

### 3.3.2.2. Nursing Group

3.3.2.2.1. wbt error rates and the number of words forming the ngps

$$P = \frac{12,85}{\sqrt{3,1019 \times 54}} = \frac{12,85}{\sqrt{167,5026}} = \frac{12,85}{12,9422} = 0,99 = 99\%$$

3.3.2.2.2. irg error rates and the number of words forming the ngps

$$P = \frac{37,06}{\sqrt{28,7238 \times 65}} = \frac{37,06}{\sqrt{1867,047}} = \frac{37,06}{43,209339} = 0,86 = 86\%$$



## APPENDIX 4 - DECLARATIONS



SERVIÇO PÚBLICO FEDERAL  
UNIVERSIDADE FEDERAL DA PARAÍBA  
CENTRO DE CIÊNCIAS DA SAÚDE

D E C L A R A Ç Ã O

DECLARO, que os alunos do curso de Medicina do Centro de Ciências da Saúde da Universidade Federal da Paraíba têm necessidade de consultar, para estudo, livros escritos em inglês. Mesmo os iniciantes têm esta necessidade.

João Pessoa, 26 de janeiro de 1981.

Assinatura manuscrita de Adanilson da Costa Silva.

Adanilson da Costa Silva

DIRETOR




SERVIÇO PÚBLICO FEDERAL

UNIVERSIDADE FEDERAL DA PARAÍBA  
CENTRO DE CIÊNCIAS EXATAS E DA NATUREZA  
DEPARTAMENTO DE FÍSICA

D E C L A R A Ç ã O

Declaro para os devidos fins que livros em inglês  
~~constam da bibliografia do programa de diversas disciplinas do cur-~~  
so de Bacharelado em Física.

João Pessoa, 28 de Janeiro de 1981

  
JULIO DE MELO TEIXEIRA

CHEFE DO D.FÍSICA

C.C.E.N.-FÍSICA